COURT OF COMMON PLEAS
CUYAHOGA COUNTY

- - -

Doc. 361

RACHEL KOCH, a minor, et al.,

Plaintiffs,

vs.

PETER SCOLES, M.D., et al.,

Defendants.

Case No. 188233
Judge Calabrese

- - -

Transcript of deposition of HOWARD C. PITLUK, M.D., witness herein, called by the Plaintiffs for examination, pursuant to Notice and Agreement of Counsel, pursuant to the Ohio Rules of Civil Procedure, before Susan W. Talton, a Registered Professional Reporter, a Certificate of Merit Holder and Notary Public within and for the State of Ohio on Friday, May 13, 1994, at the offices of Howard C. Pitluk, 6801 Mayfield Road, Cleveland, Ohio, commencing at 9:30 a.m. and ending 12:40 p.m.

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on behalf of Defendant, University Hospitals.

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PROCEEDINGS

HOWARD C. PITLUK, M.D.,

Witness herein, called by the Plaintiffs for examination, having been first duly sworn, as hereinafter certified, was examined and testified as follows:

EXAMINATION HOWARD C. PITLUK, M.D.

BY MR. VOLSKY:

Q. Would you state your name, please?

A. Howard Charles Pitluk.

Q. And your business address?

A. 6801 Mayfield Road, Mayfield Heights, Ohio.

Q. Doctor, I've reviewed a copy of a CV that was recently provided to me by Mr. Murphy. Can you tell me whether that is the most updated version on your vitae?

A. No. There's a few additions to this. I may have one. Should I see if I have it?

Q. Yes; that would be great.

A. I've become even more famous since then.

MR. VOLSKY: Put that on the record, please.

THE WITNESS: Tell you what, I think my secretary has one. Shall I tell her to get it?

MR. VOLSKY: That would be

great.

A. There's just a few additions. It's substantially the same except I'm the president of the Cleveland Vascular Society now, which isn't on there, and I'm also on the Executive Committee of the Society far Clinical Vascular Surgery, which is also not on there.

Q. Is Dr. Hutton on any of those societies?

A. I believe he's a member of the Cleveland Vascular Society. I don't think he's a member of the Society For Clinical Vascular Surgery, although he may be.

Q. Do you have any particular interest or specialization in any area which is an issue in this case?

A. I'm not sure what the issues are in this case which, I am in vascular surgery.

Q. Based on your view, do you have any particular specialization or have you done any research or anything that is an issue of this case as far as your theory of an obstructive problem or compartment syndrome?

A. Nothing over and above my usual training, no.

Q. Have you been involved in any lawsuits which involve injury or disability resulting from the surgical removal of a malformation in the upper or lower extremity?

A. No.

Q. Have you ever been in a lawsuit where an allegation was made that there was injury or damage caused as a result of an evolving compartment syndrome?

A. No.

Q. Have you ever been involved in a case during your medical training, or in your medical practice, where a vascular malformation in a deep posterior compartment was surgically removed?

9:44A A. No.

Q. So you haven't removed any type of malformation from a deep posterior compartment in your career?

A. No.

Q. Have you ever been involved in cases where a compartment syndrome evolved as a result of a bleed?

A. Are you talking about legally or?

Q. No. No. In your practice.

A. In my practice?

Q. Yes.

A. Yes.

Q. How many times?

A. Oh, two or three times, perhaps, in the last 20 years.

Q. Now, in those two or three occasions, what was the cause of the bleed?

A. Generally it was trauma.

Q. Any experience with a compartment syndrome from bleeding caused by the use of an anticoagulant?

A. No.

Q. I assume that you, from your answer, that you haven't been involved in a case where there's been a bleed subsequent to surgery which evolved into a compartment syndrome?

A. No.

Q. If one of your students came in and asked you to refer them to authoritative sources in the medical literature so that they can learn about the signs and symptoms and diagnoses of compartment syndrome, what sources would you refer them to?

MS. BOSELLI: Objection.

A. I would just tell them to read any of the generalized textbooks in vascular surgery or some of the treatises written in medicus literature index on compartment syndrome.

Q. Are you familiar with the work of Mapsen?

A. No.

Q. Never heard of Frederick Mapsen who has worked on compartment --

A. I believe I've heard of Frederick Mapsen. I'm not familiar with his work.

Q. What about Dr. Whiteside?
A. Doctor, who.
Q. Whiteside?
A. No.
Q. You've heard of Whiteside's technique --
A. No.
Q. -- for measurements of compartment syndromes?
A. Are you referring to a split catheter for measuring compartment pressures?
9:46A Q. Yes.
A. I'm familiar with that. I've never called it a Whitesides' technique.
Q. Now, before we started Doctor, you gave me what were all the materials that you reviewed in this case that are part of your file?
A. Correct.
Q. Have you reviewed any other materials that , weren't part of the file that you gave me to review?
A. I saw the venograms once. That are not part of my file.
Q. Have you conducted any review of the literature for purposes of this case?
A. No.
Q. Have you provided any literature to any of the attorneys?

A. No.

Q. Were you provided with any literature by the attorneys?

A. No, I wasn't.

Q. When was the last time you reviewed the materials that are contained in the file?

A. Probably, I mean very thoroughly reviewed them back when I wrote my letter in 1992. I have glanced over them since then a couple times this morning for about an hour. Previous time in a discussion with Mr. Murphy, several months ago, I guess.

9:47A MR. MURPHY: *Yes.*

A. That would be it.

Q. Have you reviewed any pathology in this case?

A. The actual slides?

Q. Yes.

A. No.

Q. Have you reviewed any radiological films other than the venograms?

A. No. Just the venograms; right.

MR. MURPHY: That's all I had.

THE WITNESS: Yeah.

BY MR. VOLSKY:

Q. Did you read all the depositions that you were provided?

A. That I have on my desk, yes.
Q. And that was just Dr. Hutton's deposition, is that correct and Dr. Queraf's?
A. And Dr. Queral, yes.
Q. Would you agree that Compartment syndrome is a known potential complication in surgery of the lower extremity?
A. What do you mean surgery of the lower extremity?
Q. In surgery of a lower extremity, is the development of a compartment syndrome a potential risk of that surgery?
A. Generally speaking, it's not.
Q. Why is that?
9:48A A. Because there's a lot of surgeries in the lower extremity that can go on that don't have anything to do with compartment syndrome.
Q. But compartment syndrome is one of the things that you look for that can develop after a surgery?
A. Of the, you mean vascular surgery?
Q. In the lower extremity; yes.
A. It can develop in very specific instances, yes.
Q. What about in the deep compartment of the lower extremity?
A. (No response)
Q. Is that something you would have to watch for?

A. If you're operating in the deep compartment, you're saying?

Q. Right.

A. I suppose you would.

Q. Over what period of time can a compartment syndrome develop post-operatively in that type of surgery that we just talked about?

A. What -- we really haven't talked about the type of surgery.

Q. What I'm talking about is in the lower extremity in the deep compartments; over what period of time post-operatively could a compartment syndrome potentially develop?

A. Several days. Three or four days.

9:49A So several days is up to several days; four or five days, even.

Q. Once a compartment syndrome has developed, what type of timeframe are we talking about before irreparable damage or injury occurs?

A. It's variable depending upon how high the pressures are and the acuteness of it. If there's still ongoing problems causing the compartment syndrome, if there hasn't been adequate decompression, is a variable depending on the time.

9:50A Q. Without adequate decompression, what is the

fastest time frame that permanent damage or injury can occur?

A. Hours.

Q. Would you agree that compartment syndrome requires prompt treatment and release in a reasonable amount of time after it's diagnosed?

A. Yes.

Q. Would you agree that the failure to diagnosis a compartment syndrome can be catastrophic?

A. Yes.

Q. Would you agree that one of the reasons that the diagnosis of compartment syndrome is made difficult is that other conditions may produce similar symptoms and signs post-operatively?

A. Yes.

Q. What are some of those similar signs and symptoms?

A. Of a compartment syndrome?

Q. Yes.

A. Signs and symptoms are pain, paresthesia, pallor, pulselessness, edema, paralysis, bleeding. Those are the major ones.

Q. And some of those same signs and symptoms that can occur post-operatively are not related to compartment syndrome?

9:51A

A. That's what I was going... these are signs that are seen in both compartment syndrome and non-compartment syndromes, but give you the similar clinical picture.

Q. Would you agree that, with the definition of a compartment syndrome, as being a condition in which increased pressure within a limited space compromises the circulation and function of tissues within that space?

A. That's a broad definition.

Q. So what actually occurs is venous obstruction caused by a buildup of pressure beyond outflow pressures?

9:52A A. Well, no. Just, not just venous but arterial compromise, as well.

Q. Which gets compromised first?

A. Which get compromised first? Probably venous because it's a lower-pressure system.

Q. And you could have a compartment syndrome, couldn't you, and still have arterial flow through it if the pressure is enough to stop the venous but not enough to stop the arterial?

A. Correct.

Q. Does the medical literature, or does your experience, indicate that one of the most important and

classic features of a compartment syndrome is unremitting pain?

A. I would say, no; I mean, that's not one of the classic features.

Q. You don't have to have that to have a compartment syndrome, do you?

A. Unremitting pain?

Q. Unremitting pain.

9:53A A. No.

Q. Would you agree that compartment syndrome could be developing, or could develop, with some, but not all, of the classic signs and symptoms?

A. Well, you want to define classic signs and symptoms.

Q. Ones you described.

A. I described symptoms and signs of, in response to the question of non-compartment syndromes but --

Q. You want to give me what the classic signs of compartment syndrome are that would be helpful?

A. Basically, in compartment syndrome you have pain with motion, you have swelling of the extremity involved, you have, usually peroneal nerve involvement with foot drop. You have some paresthesia and numbness.

Those are the general, classic symptoms you have.

You don't need to have all of them to have compartment syndrome.

Q. Are some of the signs and symptoms usually more apparent than others?

A. Depending on the individual case.

Q. So there's a great deal of variability among those symptoms that you've described?

9:54A A. Yes.

Q. Are some of the symptoms later symptoms rather than earlier symptoms such as, for example, pulselessness?

A. Pulselessness would be a symptom; it could be late, it could be early depending on how quickly the syndrome is developing and how severe it is.

Q. Pulselessness is a sign that arterial flow is somehow being compromised?

A. Usually that's correct. Sometimes it's because there's so much edema you just don't feel the pulse but it's still there.

Q. There is a pulse, you just can't feel it?

A. Right.

Q. Would you agree that peripheral pulses are frequently normal in compartment syndromes because intracompartment pressures are usually insufficient to affect arterial flow?

A. Distally they're insufficient, yes; but in the area where the actual compartment is involved, I'm sure the arterial flow would be compromised.

Q. Distally?

A. Meaning lower down.

9:55A Q. I understand. Distally, for the same reason capillary refill could be good even though a patient has compartment syndrome?

A. Possible. It's usually not the case, but it's possible.

Q. Would you agree that it is a goal of physicians caring for a patient to diagnosis a compartment syndrome as early as possible?

A. If it's occurring you should try to.

Q. Are there not cases where the symptoms and signs may be sufficiently ambiguous that a determination cannot be made one way or the other whether a compartment syndrome exists on clinical grounds only?

A. Yes.

Q. In those situations where you're not sure whether a compartment syndrome is developing, but you also cannot rule it out, does compartment syndrome become part of your differential diagnosis?

A. If you think about it, I suppose it's part of your differential; yes.

Q. If there are some but not all clinical signs of a compartment syndrome and since an undetected development of a compartment syndrome is potentially a catastrophic event, I would assume that you would have to continue to consider and watch for the possible further development of a compartment syndrome until such time that you could specifically rule it out; would that be true?

9:57A A. Yes.

Q. I would ask you to assume for the purposes of this question that there are sufficient equivocal signs so that a compartment syndrome has become part of your differential diagnosis.

A. Okay.

Q. Once it does, how much time do **you** allow to rule it out since if it is in fact a compartment syndrome, permanent injury can result, as you've indicated, in hours.

A. Anywhere from hours to days.

Q. So what do you, how long do you wait?

A. I wait until I feel certain that compromise is occurring secondary to compartment syndrome and then I act. The reason I say that is because to act means an operation, which I don't do lightly, especially when it's such a gray area, as we pointed out, so many other

things would affect: it, so generally speaking you try to wait as long as you can, not as short as you can, unless, as I say, you have one of those situations where you have a rapidly developing massive type of a problem; in that case I would act quickly, but I like to wait as long as I can.

9:58A Q. But within reason, because you know that if you're wrong, you could be causing tissue damage along the way?

A. I could wind up on the other end of here. If you're wrong.

Q. Well, but that's not true in a situation where you've had surgery and all you would have to do is reopen the area where surgery has already taken place?

A. If you had already had surgery, technically shouldn't have to reopen.

Q. No, unless you're suspicious of a compartment, syndrome and you've got a situation where there could be tissue-death occurring?

A. Talking about me, now?

Q. Yes.

A. When I do an operation such as this and I'm opening up the compartments, I never close them.

So that's why I'm telling you I'm waiting because the symptoms that can cause me to think about

compartment syndrome, as pointed out before, are also symptoms of a lot of other post-operative problems.

When I do an operation I never, ever close the compartment, just for that reason. Why would you close the compartment?

So in my situation, personally, that's why I can wait because I know I've already done the fasciotomies, I've already decompressed the compartments.

Q. Are you saying if you're going into the lower leg, deep popliteal, four compartments?

A. When you're going into the lower leg you're basically releasing superficial and deep posterior compartments.

Q. What about the lateral and anterior?

A. As far as the lateral, it's, to me, of very little consequence. The only one you need to be concerned about is the anterior. That is something that you can watch clearly and determine whether it's ready to release. That's, generally it's the posterior compartments that give you the problem.

Q. If those compartments are released but the leg is closed with a water-tight seal --

A. The skin?

Q. The skin, yeah. -- Cannot the compartment really

be the whole back leg?

A. It's possible. It's unlikely.

Q. How often would you want to re-evaluate the patient that you're suspicious of a compartment syndrome?

A. Again, depending upon how the situation is progressing clinically, anywhere from every few hours to once a day.

Q. Now, you've indicated that you don't take going in and doing surgery or reopening a wound very seriously?

A. No. I take it very seriously. I don't take it very lightly.

Q. I understand that.

A. Okay.

Q. But if you're suspicious of a compartment syndrome and you haven't been able to decide over a period of time whether it exists or not, wouldn't you attempt to do a compartment pressure measurement to determine whether or not there's elevated pressure?

A. I may have, yeah.

Q. Would you agree that at some point the measurements of a compartment pressure to determine whether or not a compartment syndrome exists must be done to comport with the standard of care?

10:01A

A. No.

Q. Why is that?

A. Because sometimes you don't need to do a compartment pressure to determine whether or not there's a compartment syndrome present or absent; other symptoms and signs will lead you along the path to determine that it's not a compartment syndrome, and very often some of the pressures you get are equivocal; in other words, you have a, get a pressure of 30 milligrams of mercury, or 30 millimeters of mercury, that is a, sort of an area that might be high enough for some people to operate upon, but for others, it's not high enough to operate on, then you wind up with a piece of information, put you're more on the horns of a dilemma because you have information that is confusing the picture, not adding to help you. So very often we don't do compartment pressures for that reason.

10:02A

Q. On the other hand, doctor, if you just simply are not sure, and you had mixed signs and equivocal signs, and you know that you can't tell and, if it's a compartment syndrome, you're going to have a catastrophic injury; correct?

A. No. Potentially.

Q. Potentially you'll have a catastrophic injury, if there is one going on. When you're not sure one way or

the other, easiest way to decide and get potentially more good information including a measurement that might be 50 millimeters of mercury, is to do a compartment pressure measurement; would it not?

A. You can, yes. I've said that.

Q. In general, and before there are any signs of a developing compartment syndrome, how often should a detailed neurovascular examination take place in the post-operative management of a patient who has had surgery on the lower leg, the deep compartment?

10:03A A. Before there's?

Q. Before.

A. By the surgeon, by the nurses, by whom?

Q. Everybody.

A. Well, I just do routine post-op checks. I see the patient basically once a day. The nurses, if they're in the intensive care unit, see the patient every hour; if they're out of intensive care, what, this is usually the second post-operative -- I'm sorry. The first post-operative, which is the second day after surgery -- usually just check them once a shift, sometimes every four hours, depending upon their other conditions.

If the patient is a healthy person who has an uncomplicated procedure -- I did a patient two

days ago, a fem-pop bypass, which is an operation of the deep posterior compartment, patient was in the intensive care unit for 12, 14 hours after surgery, and then went up to the surgical floor and she is being checked every shift, so that's once every eight hours. Does that answer your question?

10:04A Q. What about if a compartment syndrome remains part of your differential diagnosis?

A. Again, as I said before, it depends upon how significant the symptoms and signs are. If they're having numbness and little bit of swelling, not much more, every shift is adequate. By the nurses.

Q. What would this examination include if you've got compartment syndrome as part of your differential diagnosis?

A. Basically having the patient move their legs, wiggling their toes, do pulse checks. You might want to do pin-prick sensation, although I've often found that very unreliable.

Q. Why is that?

A. Because people are really different in the way they sense pain. And some sense sharp sensations, some people feel much more acutely than others; and it's too subjective to really give me a good clinical idea as to what is going on. Passive range of motion of the foot,

if we feel that is helpful.

Q. Would you agree that a disadvantage of determining whether or not a compartment syndrome exists over a period of days is that the signs and symptoms are somewhat subjective and this could lead to some physician-to-physician variability?

10:05A MR. MURPHY: Objection. You can answer.

MS. BOSELLI: Objection.

A. I'm sure that does happen.

Q. To attempt to keep this to a minimal, would you agree?

A. Keep what.

Q. Keep this.

A. What's "this"?

Q. Potential to a minimum, the physician-to-physician variability?

A. Okay.

Q. Would you agree that this problem will be reduced by the results of each examination being thoroughly documented?

A. No. Because it's sort of like somebody fills the elephant; somebody fills the trunk, somebody fills the tail. Even though you document, it still has differentiation. You can write down anything you want,

but it's still different.

Q. Would you agree that whatever service or services are responsible for post-operative wound management, should do neurovascular exams and document their findings after each exam?

A. In general?

Q. Yes.

A. I believe in writing notes on the chart when *you* examine a patient, yes.

10:06A Q. What are the risks associated with tissue pressure measurements?

A. In what respect, what kind of pressure? With a needle into the compartment?

Q. Yes.

A. Bleeding.

Q. Anything else?

A. Pain, injury. If you strike one of the neurovascular bundles, you could technically, potentially cause a neurological problem.

Q. Are you aware of any of those problems ever occurring in a tissue-pressure measurement during your career?

A. Bleeding, I think, yes; but I don't think anybody ever hit the nerve, that I'm aware of. I'm sure you could. As I said, I don't usually, I don't do a lot of

compartmental pressure measurements even though I do a fair amount of vascular surgery. I just don't have a whole lot of use for them.

Q. Do you have a lot of compartment syndromes that have developed?

A. No.

Q. But you aren't saying that if you had a serious suspicion of a compartment syndrome that you would hesitate in doing the measurements if you thought that information would be helpful to you in making a decision one way or the other?

10:07A A. No. If I thought it were helpful, I would do that, but the fact that I don't do it a lot indicates that usually I don't feel that it's very helpful.

I may have compartment syndromes in my patients, but they're subclinical; in other words, I don't think they're enough to warrant investigation, whether with a needle or with a scalpel and so I don't usually go looking for them unless things continue to progress over a period of time.

Q. Would you agree that the risk of a bleed is great in a patient that's been over-heparinized above the therapeutic level?

A. Above therapeutic? In what situation, Mr. Volsky?

Q. In the situation of taking a compartment pressure measurement and, as you've indicated, there is a risk of a bleed.

A. Generally speaking, no; I mean, if you're therapeutically heparinized, you're going to bleed. If you hit the wrong thing, whether you're at twice the normal PTA or five times normal PTA. Bleeding is bleeding.

10:08A Q. But you'd have more bleeding, wouldn't you, in the person that's over-heparinized?

A. Not necessarily. They're certain people, for instance, Bill Blazedale out in California, San Francisco, doesn't feel a person is adequately heparinized until their PTT is over 200 seconds, so it depends on the individuals in so far as what you consider so-called therapeutic levels of paraesthesia.

Q. Would you agree that risks associated with taking tissue pressure measures pale as compared to failure to discover tissue pressures which will cause tissue death?

A. Would I believe that -- will you say that again?

Q. Would you agree that the risks associated with taking tissue pressure measurement --

A. Okay.

Q. -- pale as compared to the failure to discover

tissue pressures which will cause tissue death if it's not released on a timely basis?

A. Yes.

Q. Would you agree with me that a Board-certified surgeon should be able to recognize a post-operative patient who has developed a compartment syndrome?

10:09A A. Not, you mean immediately? Eventually?

Q. In an amount of time to avoid serious permanent damage.

A. Probably. Yes.

Q. Would you expect a surgical resident to be able to recognize it?

A. Depends on how advanced the resident is.

Q. At what level of residency would you expect them to be able to diagnosis that before there's permanent injury?

A. I think that depends. Some first-year resident could recognize it and a five-year resident wouldn't and some fifth-year resident wouldn't recognize it and some first year-resident will. Depends on the sophistication of the resident. I can't give you a specific year, you know.

Q. Would you agree that the clinical signs and symptoms of a developing compartment syndrome can be masked by post-operative analgesics?

10:10A

A. Yes.

Q. In assessing the status of a post-operative patient, would you agree that you would want to know the quantity of analgesics the patient was taking?

A. Just in general?

Q. Yes.

A. I always know what they are taking, yes.

Q. How do you know that?

A. I look in the record. I ask the nurses. I look at the Mar. M A R.

Q. What is the M A R?

A. Medication records.

Q. That's one of the things you would want to consider in evaluating the patient?

A. Evaluate for?

Q. The condition of the patient. You're saying that that's part of your normal procedure, to look?

A. In my patient?

Q. Yes.

A. I wrote the records so I know what they're getting, and if I feel there is a problem, if they are acting inappropriately, I would look and make sure they're getting what I wrote for them or taking it off the right way, et cetera; yes.

Q. Do you manage PCA pumps?

10:11A

A. Yes.

Q. In evaluating the clinical signs and symptoms do you look for episodes of significant pain contained within the patient's chart?

A. No.

Q. So you don't review the notes in the patient's chart to determine whether there were periods of time where the patient was complaining about a lot of pain?

A. Specifically for that reason? No; I mean, I may note that, if I notice when I'm looking every the patient records that they're taking narcotics over three hours, then I'll know that something is going on with pain. Basically I'll ask the nurses, you know, "Why is that patient taking so much medication?" I'll get a report. I wouldn't just rely on the record. If I suspect some abnormal amount of pain or abuse or use of narcotics.

Q. Is that something that you would particularly look for if you suspected a compartment syndrome going on?

A. No. I would look at the patient. I would actually just talk to the patient, examine the patient. I wouldn't really rely that much on the records.

10:12A

Q. What if you had a patient who, for whatever reason, you didn't believe was particularly reliable?

A. It's not the patient that's reliable. It's my assessment of the patient that I rely on. Do you understand what I'm saying?

Q. Not really.

A. In other words, if I'm suspecting -- talking about compartment syndrome?

Q. Yes.

A. If I suspect the compartment syndrome, it's my assessment of the patient that I have to rely upon, not really what the patient reliability is; I mean, I'm looking at clinical signs and symptoms that I need to interpret a person. So, it's my reliability, not the patient's reliability.

Q. When I say "reliability," I'm talking about to be an accurate historian of what's been going on.

A. The person taking the history is the historian. That's me.

Q. Okay.

A. Okay.

Q. Person giving the history.

A. Okay. Yeah.

Q. Don't you have patients that you can't rely on the information they are giving you --

A. But that's history. I'm talking about clinical findings now.

Q. What about for clinical findings?
A. If we are talking about pain, pain is subjective; and some people experience pain certainly different than others. I take it into account, but, again, it's me, the surgeon, who has to make the decision and I have to be the one who makes the assessment of the data that is available to me, not the patient making the assessment.
10:13A Q. But you're trying to evaluate all the-data for the entire time the patient is in the hospital, not just in the hour that you're seeing that patient; would that be true?
A. That's true.
Q. You've indicated before that when you're in the 30- to 40-millimeter range, that that can be equivocal as to whether or not that is sufficient to be causing tissue damage?
A. Correct.
Q. That is correct?
A. Correct.
Q. Is there a line of demarcation that sort of, so to speak, where people don't have any dispute that above this number, you know, tissue death or damage is going to occur?
10:14A A. Usually when you're in the neighborhood of 70 to

80, then people say there's definitely tissue problems going on.

Q. You don't think that 50 is, that most surgeons are going to agree that over 50 you're going to end up with some sort of tissue death?

A. Tissue death? No. I wouldn't agree with that. Most surgeons wouldn't agree with that, either, that I'm aware.

Q. Over 50 would not cause irreparable damage?

A. No. Usually not; I mean, I'm not aware of it. I will say that most of the pressures we measure in a lot of patients, if we would measure them, would be over 50 as long as there's decompression.

Q. On a timely basis?

A. Yes.

Q. Well if --

A. Even if, for instance, again I go back to -- talking about me now; right? And while I'm rating on tissue in the leg, I've done the fasciotomy. If I get a pressure of 50 I'm not going to be too concerned about it necessarily because I've already done the fasciotomy because technically that should be adequate. So I don't know what the 50 means.

If you get in the, way up in the 70-80 range, then you would have to worry about tissue damage for,

is 40 isn't going to cause, is 50 going to cause it? I can't say that. I don't know what, if they do what data they would have to support it.

10:16A Q. Let's assume that you have done a procedure in the deep posterior compartment and during the course of the post-operative care you become concerned that there is a compartment syndrome potential developing in the anterior compartment?

A. Okay.

Q. That for some reason hasn't been released?

A. Okay.

Q. You decide to do a tissue pressure. You get a reading of 50?

A. I feel has a compartment syndrome?

Q. Yes.

A. I'd do a fasciotomy.

Q. What about if the signs are equivocal and you got a pressure reading of 50?

A. I'd watch them.

Q. For how long?

A. Until the signs become unequivocal.

Q. What if they remain equivocal?

A. Then I would do nothing. The patient is getting better. Leave them alone. If it's, he's not getting better on worse, I'll watch it. Either he's going to

get better or worse.

10:17A Q. If function is dropping, though, you would then go in?

A. Do a fasciotomy.

Q. Based on what you just said, doctor, would you agree that progressive functional loss post-operatively is consistent with a compartment syndrome?

A. It can be, yes.

Q. Is it consistent with the normal progression of a patient recovering from leg surgery?

A. Loss of function?

Q. Yes. As time goes on over several days if you're getting loss of function?

A. It could be other things besides compartment syndrome, but that's in the differential, yes.

10:18A Q. But that is an abnormal outcome of a patient post-operatively for several days, losing function along the way?

A. What kind of function are we talking about?

Q. Ability to move the toes.

A. Not necessarily; because very often when you do re-vascularization you get edema and that's, in fact almost a hundred percent of the time you get edema, and very often you cannot move the affected extremity that has edema, not because of compartment syndrome, but

things are swollen.

Q. What if you start out with minimal-function loss and after two or three days it's getting worse and there's less and less function as time goes on?

A. I'd be concerned.

Q. What are the classic, characteristic, clinical manifestations of a compartment syndrome in the deep posterior compartment?

A. Well, you have the tibial vessels and neurovascular component compromised, so you wind up with paresthesia.

10:19A Q. Where?

A. Usually in the bottom of the foot as well as the calf muscle area and distally, lower leg.

You can wind up with, generally speaking -- just in the posterior compartment?

Q. Yes.

A. You have difficulty in extension of the toes, flexion and extension of the toes, pain in the back of the calf with flexion and extension of the toes.

Some numbness, as I pointed out, and those are the major ones. There shouldn't necessarily be a foot drop because the peroneal nerve wouldn't be involved yet. It might be, you might have a foot drop.

Q. What are the classic, characteristic clinical

manifestations in the anterior compartment?

A. Well, the anterior compartment you wind up usually with a foot drop and numbness, again inability to spread the toes apart. Some tingling.

10:20A Q. Tenseness of the anterior calf?

A. Well, yeah, I suppose. Anterior compartment is pretty tense anyway. When you push on it for me, it's difficult to assess that.

Q. Do you believe that a patient who has as part of his or her differential diagnosis the possible development of a compartment syndrome should be examined at least daily by an attending physician?

A. Yes.

Q. If you had a patient that you suspected could be developing a compartment syndrome, and based on the examination of your residents, the neuromuscular status of that individual had deteriorated over a period of 24 to 48 hours, would you not want to be made aware of this?

10:21A A. Yes.

Q. If that same patient had been crying in pain despite being on continual analgesics post-operatively, would that be something you would want to be informed of as the attending physician?

A. No.

Q. Why not?
A. Because if I was notified of, as the attending physician, every time my surgical patients cried in pain, I would be notified constantly.
Q. Okay. Would you agree that if the neurovascular status of a patient went from some weakness in his or her ability to move her toes to the point where he or she could not move her toes, wouldn't you as attending physician want to be made aware of this finding so that you can make your own assessment?
A. Is it an acute thing happening?
Q. Over a period of 24 hours.
A. Well, I would assess it myself. I'm sorry. Over a 24-hour period. I see the patient every day.
Q. Assume that you hadn't. Is that something that you would want to know about?
A. Depending on the person, the situation, yes.
Q. What about if it was more actual, let's say, a period of six to eight hours that that had been happening, starting to lose function.
A. Well, yeah; I'd want to know.
Q. If *you* had a patient who was reported to be complaining of severe pain and crying in pain, and no longer moving her toes, well, doesn't the standard of care at that point require pressure measurement?

A. No.
Q. Why not?
A. Because it's just too vague; I mean, crying in pain and she is not moving her toes because she is in pain; I mean, why would I measure pressure necessarily? Pain is a subjective thing and, as I said, a lot of patients post-operatively on the lower extremity have a lot of pain and they wouldn't move their legs; I mean, they won't move the entire leg, not just the toe.

So it doesn't require in any way, shape or form, as a standard of care, require measurement.

Q. Even though if it's a compartment syndrome you could be losing function?

10:23A A. But, as I said, the question said if somebody is developing severe pain and they are weighing this pain and those together, do you have to measure? Answer is no. In their situation? No. Most of my patients post-operatively, seriously, don't move their leg even though I yell at them to move their leg because they are in so much pain and so, I don't run out and do compartment measures on them.

Q. If you have somebody who has been fine and not complaining about pain, and then all of a sudden they are starting to complain about severe pain --

A. This is post-operatively?

Q. Post-operatively.
A. They are doing great?
Q. Doing fine.
A. Okay.
Q. Yes. And they're able to move their toes at first on command.
A. And they're in no pain.
Q. And they are not having any significant problems with pain, more than what you would expect post-operatively.
A. Okay.
Q. And all of a sudden they're starting to complain about severe pain and crying in pain and now --
A. Pain, where?
Q. Pain in the leg.
A. Okay.
Q. Pain in the feet; and let's -- the functional status has gone to being able to move the toes to now not being able to move the toes, or not being able to move the toes, isn't there a suspicion of a compartment syndrome?
MR. MURPHY: Objection. Basis; I don't think that's reflected in this chart.
A. We are not talking about the chart, are we?
Q. No. Talking in general.

A. Talking in general, I thought.

MR. MURPHY: I think so, too.

A. It could be, it could be a symptom of compartment syndrome. If I was suspicion of it being a compartment syndrome, I would probably do pressures, but, as I said, it's such a variable question, so vague. I can't say that I would do them automatically.

Q. You would need more information?

A. Definitely.

Q. You would want to do your own exam, though?

A. For sure.

Q. Would you agree that the likelihood of amputation is lessened by the prompt diagnosis and treatment of a compartment syndrome as compared to the chances of that compartment syndrome has, in effect, been developing over 24 to 48 hours?

A. No.

Q. If *you* catch it early rather than late --

A. Yes.

Q. -- isn't the chance better that you're going to be able to save the leg?

A. Most, I can't recall, I think in 20 years, of doing this, I can't think of one person whose leg was lost because I didn't catch a compartment syndrome "Early enough," Okay? So it's unlikely that it would

make that much of a difference. Certainly the rapidly evolving thing, massive compartment syndrome, a crush injury, for instance, that is a different situation, but in general if you're developing a compartment syndrome, it's evolving, you know, you have some time. This isn't an acute emergency that you need to rush into it right away.

Q. Even though you can have tissue damage, as you've indicated, within hours?

A. You can, sure, but muscle damage, as an example, which is the tissue that mostly is damaged, is not irreparable and not irreversible. It's reversible; and even if the muscle is damaged permanently, there is scarring that takes place and hypertrophy of remaining muscle and from a functional standpoint you have a normal-function result.

Q. Are you familiar with the medical literature which has studied the cases where a compartment syndrome has been diagnosed and released within twelve hours of the onset of symptoms, looking back, and seeing when symptoms start as compared to the outcomes in those patients where there was a delay in diagnosis and the compartment syndrome was not diagnosed for more than twelve hours?

A. No.

Q. Doctor, would you agree with me that an-above knee amputation is a horrible injury?

MS. BOSELLI: Objection.

A. Injury?

Q. Yes.

A. I don't look at it as an injury.

Q. What do you look at it as?

A. An operation.

Q. Is it a horrible result for somebody who before had a leg and now has an above-knee amputation?

10:27A MS. BOSELLI: Objection.

A. If it's indicated, no.

Q. I'm not saying whether it's indicated or not indicated. I'm talking about the results to a patient. Without trying to lay blame on anybody, you have somebody who is a functional person who's got two good legs --

A. Right.

Q. -- and for whatever reason has had to have an above-knee amputation?

A. They have a good leg and now they have an above-the-knee amputation?

Q. Right.

MS. BOSELLI: Objection.

A. I mean, you know, it's certainly not desired; is

it horrible? It's a value judgment I'm not going to make.

Q. Would you agree it's a devastating injury for a 16-year old girl to sustain?

A. Yes.

MS. BOSELLI: Objection.

BY MR. VOLSKY:

Q. Did you review Rachel Koch's chart to her recovery after the above-knee amputation while she was in the hospital?

A. After the amputation?

Q. Yes.

A. Very briefly. I know that she did get a prosthesis and I know that she has been ambulating on that prosthesis. I really don't know what she went through to get from the amputation to the point of ambulation.

Q. So you didn't see what a difficult time she had with pain after the above-knee amputation while she was an inpatient?

A. Yes. I didn't see it, but I certainly believe she did if you tell me she did. That is not unreasonable.

Q. Have you had patients who received above-knee amputations?

A. Oh, yeah.

Q. What is your experience as to what is normally involved in recovering from that type of procedure?

A. Usually, depending on the age of the individual --

Q. Let's talk about a young girl.

A. Normally I don't have -- I don't have any young girls. Certainly 16 years old, I don't have.

But, generally speaking -- you want me to talk about it for 16 years old? Because I don't have any experience with it. I can imagine that they are going to recover more quickly than an elderly person.

Q. Tell me about an elderly person and what your experience is.

A. My experience, depends upon the motivation of the individual, will depend on how quickly they are going to recover and the degree of; for the most part if a patient is motivated and wants to get back to as much a normal life still as before, then they will work very hard and progress reasonably rapidly. Within about a three-month period of time they will be fit with a temporary above-the-knee amputation prosthesis. They will be ambulating usually with the aid of a cane. Most of these people will be able to start driving again, again with the appropriate controls in their

cars.

10:29A Q. Can they do that with the right leg where they have to use the gas pedal on the brake?

A. Generally speaking they use hand controls in those situations. They don't use their leg to drive to operate the foot pedals. Use hand pedals, hand controls.

So my experience has been that I have patients who have really even gone back to golf with an above-knee amputation. Again, these are people in their 60s, primarily. I think I had one 53, 54-year old individual who also did very well..

And they lead a reasonably normal life. They are not running races any more; on the other hand, they are driving cars, going to work, doing extra-curricular activities. They are walking.

10:30A Q. What kind of distance can they walk?

A. Some of them can actually walk several miles.

Q. What is the average?

A. I really can't tell you.

Q. Would you agree that an above-knee amputation would effect an active teenage girl more than what you've just described for elderly or older patients?

A. Probably, yeah. Just from a psycho-social aspect alone.

Q. What kind of psycho-social aspects would you --
A. I'm sure --
Q. -- believe.
A. Dating and those kinds of things; but, again, I have no experience, but I can only imagine.
Q. What was the cause in this case of the venous obstruction that occurred?
10:31A A. Venous obstruction?
Q. Yes. Your report refers to venous obstruction.
A. Outflow.
Q. Outflow obstruction?
A. I think that Rachel had a venous malformation in the upper posterior compartment of -- very close to the conflux of the popliteal vein where the major veins drain or empty and form the popliteal vein and as a result of the tying off of these major venous tributaries, I believe there were two, and removing this venous malformation, this compromised the outflow of, the venous outflow of, the lower extremity.
Q. Was it a total or partial obstruction?
A. Partial, but significant.
Q. When did it occur?
A. At the time of operation.
Q. Did the removal of the varix -- 'can I use that term -- varix, the malformation?

10:32A

A. Yes.

Q. Result in arterial occlusion which was functionally significant?

A. Eventually. I think maybe on the day of the 14th? When she was seeing, I think at that point in time, the pressure had built up enough in the leg to cause a functional varix. I'm sorry. Functional arterial occlusion.

Q. That was a secondary phenomenon?

A. Correct.

Q. Could you give me an overview as to the timing of events that you theorized occurred as far as when the obstruction began and the course which led us to the 14th?

A. Well, I think the actual outflow, compromised obstruction if you will, started at the time of operation.

10:33A Which would have been the 10th. I believe is the 10th; correct?

Q. Yes.

A. And during that time the major tributaries of venous outflow of the lower extremity were tied off that removing the varix and blood came into the leg from the arterial side and began to egress from this venous side. It couldn't egress fast enough to keep

the leg decompressed; in other words, more blood was coming in than was going out; and this developed over the course of probably two or three days to the point where pressures did build up in the leg, venous pressures built up.

Q. Where are we talking about venous pressures being built up?

A. I would say over the course, certainly on the 13th, she was beginning to get a lot of pressure built up, and the morning of the 14th, I think it was like the critical watershed period where she could no longer tolerate the pain, nor could the, physiologically the leg tolerate the pressure that had built up. I believe there was 75 or so millimeters of mercury that was measured in the leg on the 14th, and at that point they took her back to the operating room for another fasciotomy, which I don't know how that could have helped because she already had a fasciotomy and, in fact, it didn't help because on the 14th even though they had looked at everything, the leg was worse.

Q. Over what muscle or muscles was there venous obstruction?

A. I think over the gastrocnemius, the soleus, the peroneus, probably the flexordigitorum profunda, the tibialis anterior, tibialis posterior of the major

muscles of the lower extremity from below the knee down.

Q. What veins had obstruction?

10:36A A. Well, the posterior tibial veins were gone.

Q. Why is that?

A. That's where the venous varix was to begin with, in that circulation distribution.

Q. So you believe that this was not a branch into the posterior tibial?

A. No.

Q. You believe the posterior tibia, itself, was?

A. If I recall the venograms, yes, I think the actual major tibial, posterior tibial veins and over where the anterior tibial veins come in, I think those were interrupted. When you read Dr. Hutton's operative report, he talked about going proximal to tie off the posterior tibial veins. Only thing proximal up there is major trunks as they go into the popliteal vein, so those are the major; it's the tibial and, tibial veins and perhaps even the peroneal. I will have to look at the venogram again to make sure, but from what I recall in the venogram, there are two or three major veins that were there, and at least two of them were tied off.

10:37A Q. That would have been apparent to Dr. Hutton,

would it not, from the venogram, you're saying?
A. I don't know if it would have. It may have been. It may have been, but he had to do what he had to do to get the varix out.
Q. He certainly would have been aware of it because of looking at the varix?
A. No. You can't tell because it's just too much anatomy going on. You can't trace all the veins in that small area you're working.
Q. But certainly for you to hypothesize or come to the assessment that this was a major portion of that posterior tibial, that was certainly something that he had to be concerned about, as well?
A. I think he had to be concerned about getting the varix out. I don't think you needed to concern yourself at that point in time or could concern yourself at that point in time with which veins were left and which weren't left, given her antecedent history of pulmonary life-threatening pulmonary embolus.

MS. BOSELLI: Can we take a short break?

(four-minute break taken)

BY MR. VOLSKY:
Q. I want to make sure I understand what you're

telling me.
A. Okay.
Q. It's your opinion that this was a major branch of the anterior tibial?
A. Posterior tibial.
Q. Posterior tibial. And you could tell --
10:43A A. And possibly the peroneal.
Q. And what do you base that assessment on?
A. The venogram, the position where they were operating, where this varix was in relation to the muscles.
Q. What fed into the varix?
A. These veins. Branches, these came off of those peroneal and the posterior tibial vein.
Q. They're branches of the peroneal and posterior tibial, they are actually part of those veins?
A. I think they are very close to the junction with those major veins. I don't know if they're the actual veins, themselves, or branches, major branches off them, but I think when he was ligating he probably ligated one or both of those major vessels, peroneal posterior tibial veins.
Q. The veins, themselves?
A. Yeah.
Q. Is that something he would have known in doing

it, knowing he was there?
A. Probably not. Given the complexity of all the veins that were there.
10:44A Q. Well, but, you're saying, so you're making that conclusion based on hindsight of what happened or?
A. Yes.
Q. Or is it?
A. Hindsight of what happened; and from what I can, what I think I see on the venogram, but primarily hindsight.
Q. But you say you suspected, based on the location of this varix, and what was seen on the venogram, that it was very possible that this varix either fed a very major close branch of those major veins or was part of the major veins, themselves?
A. Right. On the basis of what you just said and what happened clinically afterwards.
Q. All right. Had you just had those venograms, forgetting looking back, that would have been a concern of yours based on its location?
A. I wouldn't have been concerned about it because I knew that's what I was to do get the varix out.
Q. Would you be concerned that a potential complication based on the vicarious position of the varix would have been a venous obstruction?

A. Honestly, no; because it's a rare situation to have a varix like this, to begin with, and have recurrent life-threatening pulmonary emboli. My concern would be to interrupt the poly-emboli. I wouldn't have thought of venous obstruction.

Q. But you had to know there was a potential risk based on the location of this. I'm not saying you had a choice which, but you got to say to yourself, all right, we got to do this but it's close to a major vein here and there is that potential, but you have no choice.

MR. MURPHY: Let me note an objection. That's the third time in a row you've asked the same --

A. I know what you're saying. I never had had a situation like that. I think it's a very unusual situation, and I think that I probably would have been thinking more of what had happened prior to this surgery. I see the pulmonary emboli, then I would have thought about, wait a minute, now, am I going to wind up with a venous outflow problem that can lead to gangrene that can lead to amputation.

Q. Okay. But it's clear from the venogram that it's close to these regions?

A. Yes.

Q. And after this unfortunate event happens, and you end up --

A. What unfortunate; you mean the leg?

Q. Yes. Eventually this, the surgery, and it doesn't help and eventually do above-knee amputation based on the fact that you'd seen the venogram and you knew the location of this thing, you would have concluded right away that's what happened, venous obstruction?

A. Well, I did; I mean, I looked at the records, it was sent to me. I saw the clinical situation. I looked at the venogram and I concluded right away this is what happened.

Q. It was a clear thing for you to see?

A. Clear thing? I mean, we had a horrible problem in a 16-year old girl. She lost her leg.

Q. I'm saying when you reviewed the case you looked back and your theory of venous obstruction was clear to you?

A. Yes. But I had all the records to look at.

Q. Okay.

A. Okay.

Q. Had you been the operating surgeon and seen the course of events happening, after it happens and the muscles didn't come back and they continued to die, an

above-knee amputation occurred to you, based upon the fact you knew the precarious position of that varix you would have known at that point, yes, this is clear. It was a venous obstruction?

A. It's not a question of knowing at that point; I mean, I would try to put together in my own mind what happened.

Q. Right.

A. And given the fact that patient had a fasciotomy on the loth, major decompression of the compartment on the 14th, patient had a re-fasciotomy, now the anterior compartment was decompressed on the 14th not only were the muscles not any better, they were worse, I would have to go, "What the heck's going on?" That would have been the conclusion I came to.

Q. Any other clinical information other than what you've referred to that also helped you come to the conclusion that it was a venous obstruction?

A. You know, I referred to the whole chart. I can't give you a specific, if you're asking me specific things that stick out, no, just the whole clinical picture, the review by all the different doctors, no, just the course of action; yeah.

Q. Am I correct that with your theory as well as the theory that this started out as a compartment

syndrome --

A. Wait a minute.

Q. Your theory is outflow obstruction --

10:49A A. Okay.

Q. -- precipitated this thing?

A. Okay.

Q. You're aware that Dr. Queral's theory is that this started out a compartment syndrome and developed from there to end up with the same result?

A. Okay.

Q. You understand that --

A. Yes.

Q. -- is his explanation.

Am I correct that both, under both theories you end up in the same place, which is eventual outflow obstruction, whether it's caused by your theory or caused by the compartment pressures build-up?

A. Correct. Only difference is that according to Dr. Queral, if his theory is correct, then I don't understand why the patient -- really developed a compartment syndrome given the fact that the posterior compartment had already been decompressed on the 10th and why after decompression on the 14th patient continued to worsen.

That's I said why I had to think about what

I'm thinking about.

Q. So you find it unusual that a muscle that has had obstruction resulting from a buildup of compartment pressures would continue to worsen over days?

A. Not a muscle. All the muscles; yes, I find it unusual.

Q. There are such things as compartment syndrome in all the compartments of the lower leg?

A. Yes.

Q. Can that occur?

A. Yes.

Q. Do you have any opinion as to whether or not infection played any role in this case?

A. Yes.

Q. What is that opinion?

A. I don't think infection was significant in this case.

Q. Do you have any opinion as to whether or not Rachel Koch had any type of underlying clotting abnormality which played any role in the loss of her leg?

A. I'm not aware of any.

Q. You have indicated that you believe this outflow obstruction began immediately?

A. At the time of operation.

Q. At the time of the operation.

What do you base that on?

A. Just my clinical impression.

Q. Is there anything in the records that point to that other than that's what you would normally expect to happen?

A. Well, as I pointed out, given the anatomy that I'm aware of that I've seen in the venogram and the description of the operation, et cetera, and eventual outcome, that's when I felt it started, yes.

Q. Would you agree that in general skeletal muscle has extensive collateral circulation?

A. Arterial circulation.

Q. Vascular circulation.

A. Arterial.

Q. Arterial.

A. Venous.

Q. Both.

A. There's a lot of branches. I wouldn't call it collateral, necessarily. It's got extensive circulation. Collateral is a term I don't really use for that situation.

Q. Why is that?

A. Collateral to me implies circulation around areas, not necessarily to areas, okay; around areas of

obstruction when collateral **blood** flow.

There's more than one major **blood** supply or one, there is usually one major **blood** supply and multiple small **blood** flows. If that's what you're referring to as collateral blood flow.

Q. Would you agree that in a non-elderly adult's calf, extensive infarction and necrosis resulting from the interruption of venous outflow from whatever cause is a rare phenomenon due to extensive collateral drainage which is normally present?

A. Collateral drainage? I just think, first half is correct. I don't know what it's due to necessarily but generally speaking, venous outflow obstruction in a younger adult does not result in the necrosis; is that what you are referring to?

Q. Yes. Why is that?

A. Generally, speaking there's other pathways of, venous egress. That's the major reason.

Q. So generally, if a portion of a vein is nonfunctional, for whatever reason, there is normally sufficient collateral drainage which can take over?

10:55A

A. If it's -- it depends on the degree, okay? If you have major venous obstruction high up, popliteal, for instance, or in the tibial veins and major, all the major tibial veins and you don't do something about it,

then you would develop what we call phlegmasia cerulea dolens, which is venous gangrene.

If you treat the obstruction and, say, you have massive deep venous thrombosis and you notice it, you treat anticoagulation, or clot-dissolving agents then you can prevent that problem from occurring. Okay?

Q. Uh-huh.

A. Am I making myself clear?

Q. My understanding of what you're telling me is that you choke off a major venous branch then collateral circulation cannot compensate --

A. Right.

Q. -- for the loss of that major vein?

A. Exactly because the collateral goes back into the major vein anyhow. So if you block it off, whether the collateral is obstructed or not is irrelevant. Think of a river that's running, a major river with tributaries. If the major river is obstructed at the mouth where it empties into a lake but other tributaries are still open, they are going to flow, but when they get to the very top one it's obstructed, the water still won't get out into the lake. Eventually those other tributaries will clot off somewhere, maybe not acutely but clot up as well, you wind up with

gangrene phenomenon. That's why I say if you can treat it with heparin or *urocrinans for example, then you can prevent gangrene from forming.

Q. When and where did you say ischemic necrosis occurred?

A. In Rachel, now?

Q. Yes.

10:57A A. Occurred in the leg, in the muscles of the lower leg somewhere. I don't know where. I don't know if anybody knows where. And when? The first evidence of necrosis in the 14th, if I'm not mistaken, where they actually took muscle out and there was some ischemia. I don't know if it was necrotic. I don't remember the path report, that histologic diagnosis.

Q. That's when they opened her up, she could have had ischemia earlier than the 14th?

A. It's possible. I can't say.

Q. At the point where ischemic necrosis developed what type of symptoms would have been expected?

A. Pain or absence of pain if there's enough necrosis and the nerve fibers are destroyed. It's that variable.

Q. You listed a lot of muscles that you believe suffered outflow obstruction. Is that because those are the muscles that are fed into the posterior tibia?

10:58A

A. Drained by the peroneal, posterior tibia, yes.

Q. I'm sorry. I meant drained.

A. I know you did.

Q. Which muscles in the calf had tissue death as a result of a compartment syndrome?

A. Which compartment syndrome? You mean at the very end.

Q. Whenever.

A. I mean -- you'd have to look at the pathology report. To be honest with you, I don't know if they looked at all the different muscles. From what I can tell, they didn't. They just took off the leg and they didn't look at individual muscle groups. Gastrocnemius, soleus, peroneus. They just took it off the leg. If I recall, they looked at the arteries and the veins of the three major arteries and veins that go to the lower extremity below the knee and just commented on those. They talked about some muscle, just muscle. I don't recall them mentioning muscle groups.

10:59A

MR. MURPHY: Do you want the path report?

THE WITNESS: No, I don't. For Mr. Volsky's question I don't think, I don't know, and certainly the only way to know would be to look at the

path report if they looked at specific muscles.
BY MR. VOLSKY:
Q. Is it your understanding that there were dead muscles in the anterior and lateral compartment?
A. I don't recall. I don't recall.
Q. Assuming that there were, what would have caused the necrosis in those two compartments?
A. Probably pressure; increased pressure.
Q. So those would be the result of increased pressures within the compartment?
A. Right.
Q. What would have caused that?
A. The venous outflow obstruction.
11:00A Q. How long does it take a muscle with venous obstruction to show visible signs of change?
A. Visible signs, meaning?
Q. Meaning that there is an obstruction.
A. You mean you can look at it and see it?
Q. Yes.
A. You could probably see engorgement within 24 hours, twelve hours. It depends upon how significant the obstruction is.
Q. How was there a partial obstruction if what you're saying is this was, the varix was a major -- are you saying that is a major feeding source to the

posterior tibia and peroneal?
A. It isn't, it's a feeding source. It was directly off of those two, yes.
Q. And its removal did what, cause the obstruction?
A. Well, it wasn't its removal, per se. It was the tying off of those vessels that caused it.
Q. And when you tie off this vessel, why did obstruction result?
11:01A A. Because those are the major draining Vessels from those areas.
Q. So that's what I'm -- my understanding is you're saying that there was major blood leaving this varix and then entering into the posterior tibia system?
A. Posterior tibia and peroneal system, yes.
Q. And when you tied it off --
A. But that's not the only thing going into the system. It wasn't just the varix. It was the muscles, the veins draining the muscles' compartment, as well. The muscle groups, as well.
Q. Other muscle groups?
A. The muscle groups. What do you mean other muscles? The varix isn't a muscle. It's a varix.
Q. I understand. I'm talking about posterior tibia. There is still blood draining from other muscles into the posterior tibia?

A. Exactly. It's the same analogy I made before of the river emptying into the lake. If you're way up high over the river before it empties into the lake it doesn't matter where all the other stuff is coming from. It eventually reaches that obstruction causing the stuff to back up, the blood to back up, the water to back up the full river system.

So what I'm saying is the varix is one part of it and was close to the top of that river, okay? And when you ligate up at the top, the other stuff downstream below the varix where all the other muscles are still draining but, it was ligated on top. That's why the stuff backed up. That's why outflow was obstructed.

11:02A Q. Was the posterior tibia still draining blood from other areas of the lower leg?

A. Yes. Below where it was ligated.

Q. And therefore those muscles continued to have adequate vascular flow?

A. Arterial supply?

Q. Vascular; both arterial and venous.

A. Well --

Q. Arterial supply and venous outflow?

A. Arterial flow for certain. Venous outflow was adequate in the, it was adequate until the pressure got

to the point where it was no longer adequate and blocked it up.

11:03A Q. Do you know which muscles were initially obstruction by the ligated vessel rather than those muscles that eventually also had outflow obstruction secondarily?

A. Yes. No. I really can't say.

Q. How long would it take a muscle where there has been venous obstruction to become necrotic and lose volume?

A. It's totally dependent upon the degree of obstruction; and you just can't say, I mean I really don't know. There's so many variables.

Q. If the malformation provided significant drainage for the muscles that you're saying that it did, wouldn't it have been apparent to Dr. Scoles and Dr. Hutton?

A. Malformation didn't provide any drainage -- Malformation is an anomaly. The drainage is provided by the veins we have talked about.

Q. Was that malformation functional in that it was delivering blood to the venous system?

A. It takes blood away from the muscle if it does anything; and, no, I don't think it was functional. I think it was just a source of pulmonary emboli for her,

Q. Then why would ligating the feeding branch, the two, there were how many? There were two feeding vessels to the varix?
A. If I recall correctly, yeah.
Q. And one going out?
A. Well, they all go out.
Q. What do you mean "they all go out"?
11:05A A. Veins always take blood away from something; I mean, if you want to say two going in, one goes in, two goes out, 1 don't know how you can make that -- in veins, they are all going out, as far as I'm concerned.
Q. Where they all jumbled up and in a big circumference, for instance?
A. Right.
Q. Are there individual veins within that malformation that are delivering blood to the venous system?
A. They are all delivering blood to the venous system.
Q. If they're all delivering blood, does that mean that each one of them have to be ligated when it's removed?
A. No. What you do is ligate the major ones that you can find and what Dr. Hutton did, unfortunately, I believe, is also ligated the tibial and peroneal veins

as well, which were the major outflow for the entire leg.

Q. When someone does varicose vein surgery, whole veins are stripped out without venous obstruction occurring?

A. Superficial veins totally unrelated.

Q. Aren't veins removed all the time for bypass?

A. Superficial veins unrelated.

Q. Haven't you in your practice tied off a branch of the posterior tibia vein without any problems?

A. No. I don't usually, I don't think I've ever tied off a branch of the posterior tibia. Yes, a branch. I'm sorry a branch of the posterior tibia?

Q. Yes.

A. Yes.

Q. But the problem here, you're saying, is that there was part of the posterior tibia, itself --

A. Yes.

Q. -- that was ligated?

A. Probably. That's what I can see. Don't forget this woman had abnormal anatomy to begin with. Who knows what her real venous outflow is except the, I feel the major veins that I could see on that venogram were ligated.

Q. Would you agree that there is a peroneal network

which has numerous other soleus channels going into the popliteal system?

A. I don't know, no.

Q. How many major veins go through the soleus?

A. Soleus muscle?

Q. Yes.

A. I don't know.

Q. What clinical evidence is there to support your theory that the necrosis was initially caused by outflow obstruction rather than the original source being an evolving compartment syndrome?

A. I think I've given all that; I mean, I don't know how much more I can give.

Q. But the basis of your opinion is really premised on the fact that this varix was close enough to the posterior tibia and possibly peroneal to have caused obstruction to that major vein?

A. Well, the premise of my opinion is the fact that those two vessels were ligated, or was two major outflow tracks were ligated, that the patient had a fasciotomy prior to -- on the loth, February loth, I believe, of 1989, that the refasciotomy done on the 14th failed to correct the problem and the problem continued to progress resulting in amputation on the 16th.

Q. You would not expect to see progression in the viability or non-viability of that muscle had the problem been solely from a compartment syndrome?
A. Caused by bleeding into the compartment; correct.
Q. Well, the bleeding doesn't really matter what causes the compartment syndrome, does it?
11:10A A. No.
Q. So you're saying --
A. Well, I mean, I think what is important, I feel that the problem of the increased pressure in the compartment was caused by the outflow obstruction. That was the initiating problem.
Q. But you've said one of the reasons is because the muscle kept getting worse even after the releases?
A. That's what makes me believe that's the etiology of the whole problem; correct.
Q. Because you would not expect to see that in a, muscle that had been permanently damaged as a result of too high pressures from compartment syndrome?
A. No, not permanent damage; I mean, if it's permanent damage, it's permanent damage. I wouldn't expect to see that in, A., this particular patient because she'd had a fasciotomy on the loth, number one, and, number two, she had another fasciotomy and it still didn't help on the 14th. That's why.

Q. But if there was already irreparable damage, that muscle could continue to die and show signs of deterioration over the next several days, couldn't it?

A. If it's irreparable, it's dead already. It's not going to, you know...

11:11A Q. Well, if its irreparable to the extent that you've built up the pressures and you have caused outflow obstruction, to some extent --

A. Uh-huh.

Q. -- that continues to deteriorate as the days go by, even though you've made a release, you've already done the permanent damage from the outflow obstruction which happens has also gone through the capillary system and perhaps gone over to the anterior side already to some extent --

A. I suppose that's true, yes.

Q. -- and continues to get worse as days go on, even though the release has taken place, it's too late?

A. Yeah, especially when venous outflow obstruction and release wouldn't have anything to do with it, right.

Q. By the time of the fasciotomy, was the outflow obstruction complete at that point?

A. Yeah, I think the outflow obstruction was complete at the time of operation on the 10th; I mean,

it didn't get worse, but what happened is pressures built up because of the outflow obstruction.

11:13A Q. Maybe I didn't use the right term. Did you indicate that the obstruction was total or partial?

A. It was partial but almost total; in other words, it was very significant, significant enough to cause the pressures to build up.

Q. Would it have been total by the time of the fasciotomy or would it have remained in the same state?

A. Same state.

Q. What caused the decrease in hematocrit and hemoglobin, in your opinion, two days post-op?

A. That is an interesting question because the hemoglobin and hematocrit, if you look at Rachel's chart is always low. She came in with a low hemoglobin, hematocrit as recently as the loth, was the operation. Her hematocrit, I believe was 31 percent, the hemoglobin 10 grams, which is anemic, then they dropped precipitously, but a day and a half later she came up almost a full unit of blood without any transfusion. She probably bled a unit or so in between the 11th and the 12th, or the 10th and llth, I guess. Then if you look again at the 25th, her hemoglobin is down to 8 grams again with no evidence of any bleed, so I don't know why she was that low. I think she bled, I

think she was over-hydrated. I think she was too hydrated. At one point I think that her fluid status was never properly assessed.

Have you heard a word I've said?

Q. Yes, I have. Her hematocrit on the day of the surgery is 36.3; is that normal?

A. What's the one right before it?

Q. Well, can you answer my question then I'll --

A. Is that normal? Yes; that can be normal, but it turns out --

MR. MURPHY: You have it in there.

A. It's important to see what the hematocrit was immediately before that 36.3 because that is significantly more telling.

Q. Why is that, doctor?

A. Because if you look at, 2-2, that's February 2nd, her hematocrit was 32, her hemoglobin was 10 and a half on February 10th. With no transfusions in between her hematocrit all of a sudden is 36 and more important, her hemoglobin, which is a much more accurate reading than the hematocrit, hematocrit is calculated off the hemoglobin, the hemoglobin is an actual measurement, hematocrit is a calculated measure, her hemoglobin was 12 grams on the 10th and 10 grams on the 2nd, and

that's two units of blood. Where did that come from? I assume she was dehydrated on the 10th.

11:16A Then again on the llth, after surgery, her hemoglobin is 10 grams; on the 12th it's 5.7, approximately 6 grams and then for some particular reason there's no hemoglobin on the 14th, when she has two hematocrits shown.

What's interesting about that is hematocrit and, in the morning is 21.12, hematocrit is, in the afternoon, 24.7. She had a one-unit blood transfusion in between that time period because the anesthesiologist thought her hematocrit was 18, which was the hematocrit on the 12th, but in fact, even though she again got no blood between the 12th and 14th, was supposedly bleeding, her hematocrit went up, which is sort of opposite of what you would expect to have happen. Then if you continue to look on the 24th, her hemoglobin is 7.7.

11:17A Q. What does that mean?

A. Well --

Q. How do you interpret that?

A. I don't understand it; I mean, the woman, the girl, nothing was happening to her. She wasn't having any more heparin given to her, that I am aware of, she wasn't bleeding, that I'm aware of and yet her

hemoglobin is down to 7.7 grams.

Q. What if she was getting heparin on the 13th?

A. You would have to postulate that she bled somewhere; and I don't see anybody talking about a bleeding anywhere, that I'm aware of. So her hemoglobin, hematocrit's all over the place.

I think there's no question that she probably bled a unit after surgery, maybe up to two units, but I can't say for certain, given the fact that they didn't find much blood in the leg they amputated and we see hemoglobin dropping down to 7 and a half grams, 7 grams on the 25th, which is not explained to me.

Q. Let's talk about the critical time, doctor on the loth, the day she has surgery. She's got a hematocrit of 36.3 and two days later it drops to 18; is that correct? Is that the way the chart reads?

A. That part is right.

Q. Isn't that a dramatic drop?

A. Yes.

Q. Isn't that consistent with a bleed?

A. It's consistent with overhydration and bleeding.

Q. It's a significant bleed, that's a dramatic drop, wouldn't it be?

A. Well, it's dramatic except that the next day it's up a whole unit of blood without a transfusion.

Q. But it's still low?
A. But it was low to start with.
Q. Well, that could certainly be a change in the hydration, couldn't it?
A. So could the fact that she went from 31 to 36 --
Q. We are talking in two days.
A. So am I.
Q. -- goes from 36 down to 18, and you're saying it's your opinion that she didn't have a bleed?
A. No; I think she, I know she bled between one and two units. I said that.
11:19A Q. What do you base that assessment on that she bled the one to two units?
A. On the amount of blood that was found in the leg, which was not described as being a massive amount. On the hemoglobin and hematocrit that preceded the surgery and that came after the surgery and after this purported bleed, so-called massive bleed, the fact that her hematocrit went up without any transfusion, in a patient that was supposedly bleeding on the 14th.
Q. That could certainly have something to do with hydration; couldn't it?
A. Yeah. And so could the fact that it went down.
Q. 36 to 18 is not explained by hydration?
A. Not totally, as I said, I think she a one-to

two-unit bleed.

Q. And I'm trying to understand how you're quantifying it as a one-or two-unit bleed.

A. Because she got one unit of blood on the 14th and hematocrit went up to 25 percent. She started, in my estimation, with hematocrit of 32 percent. Somewhere around 31 to 32 percent. Not 36 percent. That number is obvious dehydration because she was 31 on the 2nd, 32 on the 2nd, 24 when she came in, 34 and up to 36 on the 10th with no blood given to her, so that has to be dehydration.

11:20A If you hydrate the patient, hematocrit can only come down. Note here, between the 1st when she was admitted until the 10th when she was operated on, and then afterwards we see again her hematocrit starting to shift all the over the place with only one-unit transfusion. With a one-unit transfusion she was almost up to the same point she was when she came in and then again I started seeing it drifting and shifting in the next seven to ten days.

Q. That has to do with, she had several surgeries, didn't she, above-knee amputation?

A. I'm talking about after the above -- she had the above-knee amputation the 16th.

11:21A Q. She would have bleeding from that surgery,

wouldn't she?

A. She couldn't, she would have had no, almost no bleeding from that surgery if it's done properly.

Q. So you would expect blood soaked--

A. Not when I do it. I mean, you can lose, I say if you're really, if you're really having a bad day you can lose a unit of blood, one unit of blood in that amputation.

Q. Other doctors in this case have talked about a formula as to how much blood loss you would expect to reduce the hematocrit a certain amount.

A. Okay.

Q. Do you know what they are referring to?

A. Formula?

Q. Yes.

A. I know that one unit of blood -- what is that equivalent to, is what you're asking?

Q. Other doctors, and I apologize I don't know the formula, but they have said to have so much drop of hematocrit that equates to a loss of so many units of blood?

A. Correct.

Q. What I'm trying to understand is the basis of your opinion.

A. Usually one gra --

11:22A

Q. If I could finish, please. I'm trying to get an understanding of your opinion that that hematocrit dropped from 36.3 on the loth, to 18 on the 12th.

And you've indicated that it's your assessment that that equates to one to two units of blood. I'm trying to understand how you're basing your opinion on?

A. I don't believe her hematocrit was 36 percent, was an accurate reading on the 10th.

Q. So it was somewhere between the 32 on the 2nd, you're telling me and 36 --

A. No. I think after surgery her hematocrit was probably around 29, given what it was on the 11th at 7:00 in the morning, 2-11; and her hemoglobin was around 10 grams as it indicates on the 11th.

Q. What if she had already bled at that point?

A. Then it should be a lot lower.

Q. I'm trying to understand why you don't think that the readings on the 10th are accurate readings.

A. Because on the 2nd she was 10 grams, 10 and a half grams of hemoglobin. Okay? The one just immediately preceding the loth, one that we have written in the chart, her hemoglobin and hematocrit went up.

Q. That's, you're saying eight days earlier?

A. Right. Eight days earlier. At one level eight days later it went up. Okay? The only way your hematocrit and hemoglobin go up is if you're transfused or you're dehydrated; and I'm telling you she wasn't transfused, so she was dehydrated on the 10th. That's why that 36 reading is not an accurate assessment of what her true value was.

More to the point is the assessment when she came into the hospital before they withdrew her from her usual routine, where she was eating and drinking normally on the outside, I would say that she was probably around 32, 31, hematocrit, 10, 10 and a half grams of hematocrit.

She came in, she became dehydrated over eight days so the 36, 12.3 readings are erroneous, not accurate assessments of her blood volume. I think more accurate are assessments on the 11th where she's been hydrated in the operating room with intervenous fluids and then she had that episode, if you want to call it that, on the 12th.

Q. What caused the episode?

A. On the llth, I assume she had more hydration and a one- to two-unit bleed.

Q. What caused that one- to two-unit bleed?

A. Probably the post-operatively bleeding that you

would see in an anticoagulated patient, someone who has had had major surgery in the lower extremity, raw surface area, on heparin, and she bled.

I think that she would have bled had she been, had a PTT of 65 seconds, or 265 seconds, she probably still would bleed.

11:25A Q. The same amount?

A. Probably. Within a reasonable degree of medical probability. That is why you don't want to heparinize the post-operative patient. The problem with Rachel and the doctors, that part, they were between a rock and a hard place. They have a young woman who has no pulmonary emboli, life-threatening -- life-threatening pulmonary emboli. They need to keep her anticoagulated because of that fact. They have to operate upon her, and one of the major contraindications to heparin is the post-operative patient, but they can't put an umbrella in her, which would be the other way to protect from pulmonary emboli, because she is only 16 years and an umbrella probably has more complications than the heparin, or potential more down the line. So they are in a tough situation.

Granted, I will grant you the fact that you don't, they didn't want to give her 10,000 units of heparin an hour. That was a mistake on their part. I

don't think it made a difference insofar as the amount that they bleed.

11:26A Q. Why do you say that?

A. Because you're going to bleed with PTA at 65 seconds in the post-operative patient just like if your PTT is 265 seconds.

Q. Why is that?

A. Because bleeding is bleeding. Once you start bleeding, you bleed. The whole point of anticoagulation is thinning the blood out. Once you start bleeding, you're going to bleed.

Q. But thinning it with ten times too much heparin will make it thinner within a therapeutic dose, wouldn't it?

A. I understand that. But I'm telling you some people, their therapeutic is over 200 seconds. Therapeutic means therapeutic. So you're bleeding between the clot. That's what therapeutic means in this situation, and I'm telling you that a lot of people, that range of what some people call therapeutic, in other words, what it takes to keep the blood from clotting can be anywhere from two to one and a half times the PTT up to greater than two minutes. Greater than two minutes depends on who's given the heparin.

11:27A

Q. If it's a therapeutic dose and you have a leak from a suture from the surgery --

A. It's not a leak from the surgery.

Q. What is it from?

A. It's from the cut surface of all the muscles you're cutting in there. There's a raw surface oozing.

Q. Your cutting surface, and it's oozing blood in a therapeutic level, that blood still has an ability to clot somewhat. It's just slower; is that right?

A. Yes.

Q. And if you are giving ten times too much heparin, that partial clotting ability isn't there?

A. Sure, it is.

Q. To the same extent, it is?

A. Not to the same extent, but you sure have partial with clotting ability still present.

Q. But you're going to need more because there is going to be less clotting at ten times too much heparin?

A. It's impossible to say. It's truly impossible to say that. The reason you give heparin is to keep the blood from clotting in the vessels, not outside the vessels. You don't want people to bleed. You don't give people heparin so they would bleed outside the vessels. You give it so they don't bleed inside the

vessels and inside the vessels you're dealing with a totally different cascade, a totally different mechanism for clotting as well as for anti-clotting.

Once you're outside the vessels, it just doesn't matter. Once you're bleeding, you're bleeding.

Q. Is the clotting feature inside the vessel the same --

A. No.

Q. -- at therapeutic levels of heparin as compared to ten times?

A. Yes. The inside the vessel.

Q. Why is that?

A. Because all the factors that are circulating, they are in the vessel, they are all there. They are all there. That's the point of heparin, and that's the reason why different dosage schedules are given by different doctors, and it's really a matter of personal preference.

Q. Do any of them ever give the amount of heparin that was given to this patient post-operative?

A. Yes.

Q. Why?

A. Because they want to make sure the blood doesn't clot in the vessel.

Q. So there is a difference in the vessel between --

A. According to those guys. There's other people who say it doesn't matter. You don't need to give that. It's really a subjective thing.

Q. I want you to assume in a hypothetical question that post-operatively Rachel bled from the surgical site and that as a result pressure in her calf increased to the point where a compartment syndrome developed.

Wouldn't a gradual increase in compartment pressures resulting in a compartment syndrome lead to the same clinical picture you've seen in the material that you've reviewed in this case?

A. Assuming that your scenario is true, yes.

Q. Doctor, would you agree that medicine is not an exact science?

A. More than anybody in this room, probably; yes.

Q. Now, your opinion of what caused this problem is your most likely hypothesis; is that correct?

A. To the best of my clinical knowledge, yes.

Q. Would you agree that even though your theory is more likely, the theory of a bleed leading to compartment syndrome is a possibility in this case?

MR. MURPHY: Objection. possibility.

MS. BOSELLI: Same objection.

A. Within a reasonable degree of probability or possible?

Q. Probability.

A. A remote one.

Q. And the reason you say that, what are the reasons why it's a remote possibility?

A. As I said before, it has to do with the clinical picture in the case as to what happened, way it happened, what happened after things were done to remedy what was supposedly a compartment syndrome from a bleed. Or for whatever reason, it just, didn't get better.

Q. I want to go through specifically --

A. I did.

Q. -- what reasons. Well, let's talk about them and make sure I understand them all.

As you said, clinical course after the fasciotomy is one of the reasons?

A. Correct.

Q. I think you've indicated that the lack of finding of massive blood in the limb, itself, is a reason?

A. Reason.

Q. That it isn't your opinion that the theory of a bleed leads to compartment syndrome?

A. Correct.

Q. What other ones; are there any others?
A. Well, just the whole presentation, the way the patient presented with waxing and waning symptoms, the way that she was assessed by various different doctors at various different times and nobody said, this is a compartment syndrome.
The fact that there was this venous malformation and abnormality in the venous drainage of the lower extremity, fact that they found a bleed up in the thigh and not just in the calf.
I mean, all of these things would make me feel that there it wasn't the bleeding that caused the problem.
Q. Any others?
A. I'm sure 1 gave others before. I don't recall.
11:33A Q. Forgetting for the moment whether it can -- let me start again.
When do you believe that a compartment syndrome developed?
A. As I said, I believe she developed a significant problem probably on the morning of the 14th.
Q. You don't believe that any of the signs and symptoms that were present on the 13th was evidence of a compartment syndrome?
A. Beginning compartment syndrome possibly, yes; in

retrospect, probably they were.

Q. In retrospect?

A. In retrospect probably the 13th were beginning to show signs of a compartment syndrome.

Q. Forgetting for the moment whether it could have been detected at that point, assuming that it had, and an immediate release done --

A. (Nodding head).

11:34A Q. -- do you have an opinion as to whether the outcome in this case would have been any different?

A, I do.

Q. What is that opinion?

A. It would not have made one bit of difference.

Q. Were did the clots which were found in the Hunter's Canal at the time of the above-knee amputation come from?

A. From the leg, lower leg.

Q. How?

A. Blood just tracked right up the canal.

Q. When?

A. During the course from the time of her surgery until the time of amputation.

Q. Why would blood track up?

A. Why?

Q. Yes.

A. Because there's a place for the blood to go. That's also one of the reasons why I don't think that the bleeding caused the compartment syndrome. Compartment syndrome is just that. You have a fixed compartment. I have never seen a compartment syndrome that releases itself up the Hunter's canal.

11:35A Q. What if it has nowhere to go?

A. Then you have a compartment syndrome.

Q. That's, you do have a compartment and it goes up?

A. No. Once it goes up, that's telling you you don't have a compartment syndrome. You've got a release.

Q. If the pressure is such that the least amount of pressure is to track up the vascular channels, because there's no more room in the leg, that would be consistent with a bleeding, wouldn't it eventually go up the vascular channels?

A. I've never seen that; I mean, what I'm saying is just the opposite of what you're saying.

You're saying that pressure was so great that we saw some blood up in the leg. What I'm telling you, that to me indicates that the pressure couldn't have been that great because there was bleeding; there was egress up the Hunter's Canal which we would not normally see in compartment syndrome.

I'm not aware of any literature that says when the pressure gets so great, nor am I even aware clinically, by the way, when the pressure become so great in the lower leg the blood squeezes up like pastry squeezer up into the leg.

11:36A Q. Why wouldn't it?

A. Why would it?

Q. It's got nowhere else to go.

A. It stays in the leg.

Q. It's already full in the leg. There's no more room. We are not talking about the belly. There's not a lot of open space in the calf.

A. Why didn't it ooze out the thigh?

MR. MURPHY: Objection. You're getting argumentative. Wait a minute. You're getting way beyond trying to understand. It's nothing except argument. You want to put the question to him again once more and get an answer so you understand fine; but it's got to stop at this point.

BY MR. VOLSKY: I'm not -- he was in the middle of an answer.

BY MR. VOLSKY:

Q. Am I correct that there is not a lot of open space in the lower calf of a young girl?

11:37A A. I guess not; I mean, I don't know what "a lot"

is.

Q. But it wouldn't take all that much blood to create enough pressure to cause a compartment syndrome in a lower calf, would it?

MR. MURPHY: Objection; that had been fasciotomized before?

A. In Rachel Koch?

Q. Yes.

A. I think she had been fasciotomized. If the pressure, there was that much bleeding and that much pressure, you would not expect the blood to go up the canal. I would expect it to come out of the skin incisions. That's really the path of least resistence.

Q. With a water-tight seal that would also be true?

A. What's a water-tight seal?

Q. That's the way Dr. Scoles described the way that he had sutured the leg closed.

A. To me, blood goes out the skin when there's bleeding. That's what I also see.

Even in an anticoagulated patient.

Q. Why is that?

A. It flows.

Q. More than if it's at therapeutic level?

A. No; therapeutic, when I say, anticoagulant, I assume therapeutic; whatever level you want to call it.

11:38A

Q. Again, it doesn't matter if it's ten times too much; doesn't make a difference?

A. No. Anticoagulant is anticoagulant.

Q. Do you have any opinion as to whether or not the surrounding muscle tissues around the varix were vascularly compromised in any way?

11:39A A. No.

Q. Can you point me to any literature which described the scenario you have theorized occurred in this case; namely, removal of a malformation which resulted in venous obstruction which evolved into a compartment syndrome?

A. No.

Q. And you, in your practice, had never experienced this, ever; is that correct?

A. No. This whole concept of a v rix malformation is an unusual one.

Q. Would you agree that giving the order of the amount of heparin ten times over what was intended to be given at approximately four, until approximately four a.m. the day after surgery, is a breach of the standard of care?

11:40A A. If it was done unintentionally, it is.

Q. Based on your review of the records which services were involved in Rachel's care?

A. The pediatric service, the orthopedic service and the vascular surgery service.

Q. What services or service were responsible for diagnosing post-operative complications relating to the leg?

A. The vascular surgery service, probably the orthopedic surgery service.

Q. Would you have expected both services to perform regular examinations of this patient to make independent assessments of the patient's neurovascular status post-operatively?

A. I would probably, I will say, yeah. They were, both have to be, they're both involved in the care.

11:41A Q. Were you aware that Rachel had complaints of increased pain about one a.m. the night after the surgery, early morning hours of the surgery.

A. llth?

Q. On the 11th; one a.m. on the 11th.

A. Increased; no, I mean she was having pain. I don't know if it was increased.

Q. There's another reference in the chart that she had another episode of increased complaint of pain about 7 a.m. this morning. I think she was bolused with additional morphine at that time; are you aware of that?

A. Yes.
Q. Do you have any opinion as to what was causing the problems?
A. Post-operative pain.
Q. Do you know how much analgesics Rachel was receiving through the PCA pump on that first post-operative day?
A. I can look. 1 don't recall.
Q. Are the number of attempts a patient makes in an attempt to get additional doses of analgesics evidence of the amount of pain the patient is having?
11:42A A. I mean it's, pain is subjective. So it's evidence of how much an individual patient is experiencing, but 1 don't know what that means. I have patients on PCA pumps who hit the button a hundred times an hour.
Q. Does that mean anything?
A. It means they don't suffer pain very well. Pain is very subjective.
Q. Like to refer you to Dr. Scoles' note on the 11th.
A. Should I look through?
Q. If you would, please.
A. Sure. Is that 2030 hours?
Q. Yes.

A. Okay.

Q. He makes a reference to stocking-like anesthesia over the plantar and dorsal aspects of the patient's foot to the level of instep consistent with an evolving compartment syndrome. I'm sorry. Is that consistent with an evolving compartment syndrome?

11:43A A. It's consistent with, yeah; could be.

Q. Is a trace extensor hall -- and I may be mispronouncing it -- halluces function consistent with a compartment syndrome?

A. It could be.

Q. Since he mentions it, is it fair to say that your interpretation of it of, of this note, was that he was considering compartment syndrome as a possible cause?

MR. MURPHY: Objection.

BY MR. VOLSKY:

Q. Of these complaints?

A. Just the opposite. I think he says what he feels. He is doubting compartment syndrome.

Q. But he doesn't rule it out?

A. He doubted it.

Q. But he doesn't rule it out?

MR. MURPHY: Objection.

A. No; but, again, in medicine, as I pointed out earlier, it's very inexact. You have to go through

clinical impressions; and his clinical impression was that it was not a compartment syndrome.

Q. I believe you told me earlier that it was possible for a compartment syndrome to develop even if the deep and superficial posterior compartments had been totally released?

11:44A A. I don't think --

Q. Am I correct?

A. I don't think I said that but...

Q. Is it possible?

A. Eventually, I suppose it could, yes. It's possible; unlikely.

Q. What would cause it?

A. Venous outflow obstruction.

Q. Anything else?

A. Anything that will increase the volume of that leg.

Q. Doctor, you are aware that this examination by Dr. Scoles took place on the evening of the llth, which was a Saturday, and that Dr. Scoles was planning to be out of town until the following Wednesday?

A. Yes. Subsequent. I saw that he wrote in the chart he would be out until Wednesday and Dr. Cooperman will cover starting Monday.

Q. What was your understanding of who was going to

cover on the 12th?

A. I didn't really think about it. I would assume Dr. Scoles perhaps or, the vascular service or pediatric service.

11:45A Q. Dr. Scoles was leaving?

A. Well, we don't know when he's leaving, He says, "I will be away until Wednesday." Could leave Tuesday for all we know.

Q. Assume that the facts are that he saw the patient at 8:30 this night on the 11th and he was planning to leave on the 12th.

A. Okay.

Q. Do you have any understanding as to who the attending orthopedic person was going to be covering this patient --

A. No.

Q. -- on the 12th.

A. No.

Q. But according to Dr. Scoles' note Dr. Cooperman was to start on Monday?

A. That's what the note says.

Q. I'm sure you'd agreed that there's no problem, you don't have any problem with Dr. Scoles signing out the patient to another Board-certified orthopedist in his practice group?

A. Correct.

Q. And I assume you have no problem if Dr. Scoles talked to that orthopedist and told him that the residents would watch her on Sunday and call him if he had any problems?

11:46A A. That's correct.

Q. I'd like to ask you for the moment to assume that the vascular service was not involved in this case.

A. Okay.

Q. That the surgery was done by orthopedics and that Orthopedics was following the patient.

A. They did the venous surgery?

Q. Let's just talk in terms of the fact, I'm more concerned, the question is going to deal with post-operative management.

A. So this patient got an orthopedic case?

Q. An orthopedic case.

A. Okay.

Q. Since a developing compartment syndrome had not been ruled out by Dr. Scoles, what type of communication, if any, should Dr. Scoles have had with the residents that were going to follow Rachel on Sunday as to what to do if patient muscular vascular status either remained equivocal or got worse?

11:47A MR. MURPHY: Objection. Two

fold; obviously vascular was involved, number one, Dr. Scoles, you're saying he didn't rule it out. I believe he said it in his deposition. That's his testimony. Doubt compartment syndrome.

BY MR. VOLSKY:

Q. Was that your testimony, this note means to you that Dr. Scoles ruled it out?

MR. MURPHY: Scoles' position, he said.

A. No, that was not my testimony.

Q. Your testimony --

A. It's unlikely he didn't consider it as very likely, at all; but we have a hypothetical. Is that what we're dealing with?

Q. We are dealing with the interpretation of the word "doubt" and what that means.

A. Doubt. When you doubt something, you doubt it.

Q. You've thought of it, but you don't think it's --

MR. MURPHY: I'm going to object because you're asking him to go into Dr. Scoles' mind. You've already inquired of him at his deposition.

Q. Okay. Do you believe it was appropriate for Rachel not to be examined by an attending orthopedist on Sunday the 12th?

A. It was --

MR. MURPHY: Objection.

A. I don't think it was appropriate. It was not inappropriate. Let's put it that way.

Q. Do you believe that it was appropriate for Rachel not to be examined by an attending orthopedist on both Sunday the 12th and Monday the 13th?

A. As long as some attending like in vascular surgery service saw her, it was not inappropriate.

Q. I want you now to assume, doctor, that Dr. Scoles has testified that it was his understanding that while he was gone Rachel's post-operative wound care was being primarily managed by the vascular service.

A. Okay.

Q. Until Dr. Cooperman returned, Dr. Hutton has testified.

A. Wait. Dr. Cooper --

Q. Until he returned.

A. Where did he go?

Q. Dr. Cooperman was gone until Monday?

A. Oh. I didn't know.

Q. You can assume that to be true.

A. Okay.

Q. So until Dr. Cooperman came back.

A. So basically, Sunday.

Q. Sunday.

A. Is the day we're talking about?
Q. We are talking about Sunday, and we are in fact talking about Monday, as well.
A. Okay.
Q. And Dr. Scoles has testified that it was his understanding that while he was gone until Dr. Cooperman returned, whenever that was --
A. Vascular surgery would be covering?
Q. -- vascular surgery would be covering.
A. Okay.
Q. And Dr. Hutton has testified that it was his understanding that Orthopedic service was at all times the service in charge of managing Rachel's post-operative wound care.

Assuming that there was such a misunderstanding, you would characterize that as a misunderstanding?

MR. MURPHY: Objection.

BY MR. VOLSKY:

Q. If that's their testimony.

MS. BOSELLI: Objection.

MR. MURPHY: Objection. Mischaracterized the testimony.

MS. BOSELLI: Objection.

MR. VOLSKY: You can answer.

A. If there was a misunderstanding? If what you're representing is the case, that they say there's a misunderstanding, then who am I to say they didn't have a misunderstanding; if they had a misunderstanding.

Q. Assume there was a misunderstanding between the two services. Would you not agree that this miscommunication fell below the acceptable standard of care if she was not seen by an attending surgeon for two days who felt that they were primarily responsible for her post --

11:51A MR. MURPHY: Objection.

MS. BOSELLI: Objection.

MR. MURPHY: Unless you give him the complete testimony of Dr. Hutton on wound care.

A. I will say --

THE WITNESS: Should I answer anything or not?

MR. VOLSKY: You can answer.

MR. MURPHY: I'm going to give you the, Dr. Hutton's testimony talked about wound care. The orthopedic had closed the wound and they were following the wound. He's following the leg.

A. Question is whether or not that's below the standard of care if no attending saw the patient for two days?

Q. Right. Who felt that they were primarily in charge.

A. Wait a minute. I'm just saying if no attending. I don't care who felt they were in charge. It doesn't matter who's in charge. If no attending saw this patient for two days, then I believe that's below the standard of care.

Q. What about if you would assume in saying that to meet the standard of care whoever is, whatever attending is seeing that patient, you would expect that individual to do a full neurovascular examination; wouldn't you?

A. I expect the individual to evaluate his patient fully. Neurovascular, it's not necessary, no. You do whatever is necessary that's dictated by the status of the patient.

Q. I think you told me earlier in your testimony when we were talking about generally an attending surgeon should document full neurovascular examination each time he sees the patient?

A. No. I said he should document when he sees the patient; in other words, he should write notes in the chart. What he writes depends upon what he does.

Q. Would you expect him to do a neurovascular examination?

A. As I said, only if the situation warranted it.
Q. What if there are equivocal signs of developing compartment syndrome?
A. (No response)
Q. Would you expect a full neurovascular examination to be done?
A. If they're equivocal?
11:54A Q. Yes.
A. No.
Q. I want to refer you at 9 o'clock p.m. all the way to the right under "additional data"?
A. Uh-huh.
Q. Does it not say that there is poor sensation, color pale pink, capillary refill brisk since splint open. Do you see that?
A. Warm to touch, poor color, purplish; is that what it says?
Q. Pale pink.
A. It says pale pink, cap refill, oh, good, had other words crossed over.
Q. Brisk?
A. Pale pink cap refill brisk since splint open. That's what it says.
Q. Do you have any significance for that finding?
11:58A A. I have no idea what she's taking about.

Q. The splint was opened by Dr. Scoles about 8:30 that night that we talked about when he checked the wound.

A. Okay. Where she says posterior wrap splint on; is that it?

Q. Yes.

A. What does that mean, open?

Q. I guess took off the bandages to look at the wound?

A. Okay.

Q. Does it tell you anything?

A. Tells me she had a capillary refill. Pink is the color it should be.

Q. Pale pink?

A. Yeah. And the foot is warm. That's good. I mean that's normal, too. I don't know what poor color means. That means nothing to me. Pale pink is good color.

Q. I believe, and I can't tell from my copy because it's not as good, but I thought that there was a word poor sensation. Can you read that?

A. This is slightly visible here. I don't know what that says. If you say it says poor Sensation, I suppose you can ask the nurse what she wrote. It's pretty illegible. Do you want to see if I have a copy?

11:59A

Q. No, thanks. On that same sheet at around 2 a.m. is there not a note which says that the patient's temperature increased to 38.81

A. Yeah. Do we know if that's rectal or oral?

Q. I don't know?

A. Because it's circled. Sometimes circled means rectal, but, okay.

Q. Is there also a note there HO aware. Do you see it right above it at about 1 or 2 o'clock?

A. I see it, yes.

Q. That means House Officer?

A. Correct.

Q. Do you have any opinion as to why Rachel began running a fever at this time?

A. Probably Post-operative atelectasis, not coughing, not taking deep breaths. That's what you see in post-operative patients, especially when they are taking narcotics.

Q. How long would you expect that to last?

A. Until she starts coughing, 24, 48 hours.

Q. I'm going to represent to you that she started running a fever with this entry and that did not go away until after the above-knee amputation?

A. Okay.

Q. Do you have any opinion as to what caused that

fever?

A. Yes.

Q. What is that?

A. I still believe it's pulmonary related.

Q. Is a fever consistent with muscle necrosis?

A. Usually not; but, again, I'm not an expert on muscle necrosis.

Q. Fortunately.

A. Yeah.

Q. To what do you attribute the abnormal findings that Dr. Scoles mentioned in his note?

A. Which note now, the llth?

Q. Note we talked about at 8:30 on the 11th.

A. As I said before, post-operative changes. Beginning of the venous outflow obstruction, perhaps.

Q. What type of symptoms would you expect to see at the beginning of a venous outflow obstruction?

A. As I described, some paresthesias, numbness, some pain.

Q. What does pupil constriction, what causes that? I see it several times.

A. Morphine.

Q. Is that a sign of just being on adequate doses of morphine or whether it's too much?

A. No. Any narcotic will do that.

Q. I want to refer you now to again those nurses' notes. The pediatric day sheet 24-hour assessment for the 12th of February.

12:02P A. It says 12 February '89 on top?

Q. Right.

A. Okay.

Q. It's actually the 24-hour nursing assessment which I believe is the next page.

A. On the back, yes.

Q. Yeah. Do you see a reference to the foot appears edematous?

A. Excuse me. Under what heading?

Q. It's under neurological.

A. Okay. I'm sorry. Left leg elevated, foot appears edematous. Pedal pulse palpable.

Q. Do you have find anything significant about those findings?

A. No. That's what I would expect. Especially with the edema. In some venous outflow compromise you would expect edema.

Q. Do you believe it's possible for a patient who is on morphine sulfate to mask some of the symptoms such as pain and paresthesia?

10:03P A. Paresthesia probably not; pain would be lessened. Perhaps paraesthesia also.

Q. What is the range of morphine sulfate that you would expect a patient Rachel's size about 105, 110 pounds to be receiving by PCA post-op?

A. Per hour?

Q. Let's talk about her per day, anyway.

A. Usually PCA is done by hour. Usually have a one milligram basal rate. At 16 years old at 105, 108 pounds is an adult woman, in so far as size is concerned, so I will assume a basal rate of-the one milligram an hour and lockout probably have anywhere from six to ten milligrams usually an hour.

Q. How many days would you expect a post-op patient with this type of surgery to continue to use that amount of analgesic?

12:04P A. It's variable. Anywhere from one day to six days, five days.

Q. I want to refer you now to some doctors' notes on the 13th, and I'm referring to Dr. Tradonsky's note. It says at the top, three-day post surgery?

A. Day three post-op. Surgery.

Q. You see the first line. It says complains of severe pain level leg. Crying in pain?

A. Yes.

Q. Do you also see further down that the patient was complaining of pain in the right aspect of her calf

with dorsiflexion of the toes?

A. Yes.

Q. If you had been the attending physician and had those findings is that something you would have wanted to be made aware of?

A. No.

Q. Why not?

A. Because I don't think, pain in the one side of the calf dorsiflexion, I would expect to have that.

Q. That's not a classic sign of an anterior compartment syndrome?

A. No. No; in the calf? No; that is not anterior compartment, at all.

Q. What is the posterior compartment?

A. It's just calf pain. It's not a classic sign of anything except post-operative pain. If a resident would have called me up on the 13th, which I believe was a Sunday, was it not? And told me the patient, any, patient post-op, had pain in her calf on day three after I had operated on her, I would kill him.

Q. Referring you now to the orthopedic note on the 13th.

A. Okay.

Q. You see it at the bottom?

A. Same day?

MR. MURPHY: Previous page, I think.

12:06P A. Previous page. Ortho.

Q. Got that, yes. Do you see that there's a finding that the patient was not moving toes well this a.m.?

A. Yes.

Q. There was pain. That pain was, passive motion was not impressive; correct?

A. Not impressive; correct.

Q. Anterior compartment swollen, sensation intact the first dorsal web space?

A. Uh-huh.

Q. Would you agree that these findings are evidence of deterioration in the neurovascular status in the patient since her first day post-op?

A. No. Because I don't think that these, there's deterioration. These are normal post-operative findings.

Q. But she started out with a trace and there was that muscle that I said I'd never pronounce right was Flexor Halluces?

A. Halluces; right.

Q. Halluces, but that otherwise she was able to move her toes well on the 11th. Is that correct?

A. Correct.

Q. And now you're starting to see that she's say not moving her toes well. At this point is that not a deterioration?

12:07P A. It's a subjective finding, not moving toes well; I mean, I don't know what that means; again, it's a subjective; he wasn't --

Q. No; there is now --

A. I'm sorry. He wasn't concerned enough I think to do anything about it; and it's a judgment call; I mean, I feel that if this person, I would trust that this, if the person felt that there was a significant change they would do something about it. She didn't do anything about it.

Q. That doesn't mean it's the right decision; does it?

A. I can't answer that. I can only tell you that it's a subjective finding. Not moving toes well this a.m., but then he says not impressive in the next sentence.

Q. But that's a resident and there is some subjectivity to that; is true?

A. No question about it.

Q. Is the anterior compartment being swollen evidence of an evolving compartment syndrome?

A. No.

Q. It's not consistent with it?
A. Again it's a very, I don't think you can even make that statement. The anterior compartment was somewhat swollen. I think it's a sort of a silly statement to be made.
12:08P Q. You wouldn't expect that of an experienced resident?
A. I wouldn't expect it, that from anybody. I don't know how he would have assessed that. And anterior compartment is inside. How does he know it's swollen on the inside?
Q. Doctor, I want to refer you to nursing notes dated the 13th, as well.
A. Are those on the pediatric thing?
12:10P Q. No. Actually it's a note in the chart. There is a nursing note in the middle of the page.
A. 13th.
Q. Yes. 13th. There's no two nights dated 13. Bottom one is 14.
A. I have it.
Q. You have it?
A. Nursing note, right.
Q. Under assessment.
A. Yes.
Q. Do you see that the nurse indicates that the

patient's leg is swollen with edema to the toes?
A. Leg swollen with edema to the toes, yes.
Q. Now 1 want to refer you to again the back and forward page of the 24-hour nursing assessment.
A. Pediatric sheet.
12:11P Q. It's the nurses' notes.
A. It says pediatric day sheet?
Q. Right. Pediatric day sheet.
A. Okay.
Q. It's undated but I think we've pretty much figured that this is in fact the notes for the 13th.
MS. BOSELLI: Better help him because it's way in the back, Kerry. If you recall, it's out of order.
THE WITNESS: What does it say on the top?
MR. VOLSKY: Mine is different than yours.
MS. BOSELLI: All right.
BY MR. VOLSKY:
Q. Which page are you looking at, pediatric day sheet?
A. Whichever you want.
Q. It's starts out 16-year old white --
A. I have it.

Q. -- female on bed rest?

A. Right, I have it.

MR. MURPHY: Let me just note, I don't know whether this is the 13th or not. I have a sheet in front of me that is 12 and the one in front of that says 12. I'm not saying it's not, but go ahead. I just don't know.

MS. BOSELLI: Is there a question?

MR. VOLSKY: Not yet. Give me a second. I'm trying.

BY MR. VOLSKY:

Q. The 24-hour nursing assessment was signed by the nurse at 2 p.m. on this day?

A. 1400 hours?

Q. Am I right, that's 2 p.m.?

A. Are you asking me?

Q. Yes.

A. Yes. I believe that's correct.

Q. Under cardiac, is there not an entry which indicates that the left leg and feet are extremely edematous?

A. Then it says toes warms. Is that one cap refill brisk?

Q. Yes.

A. Yes. That's what it says.
Q. Under musculoskeletal is there not an entry that Rachel is unable to move her left toes?
A. Left toes unable to move, is what it says.
Q. Is that a significant finding?
A. I don't think so.
Q. Why?
A. Why?
Q. Yes.
A. Because everything else is, you know, normal. She has toes warm, capillary refill brisk, moving extremities without problem. Then she says left toes unable to move. I don't know what that means.
Q. You don't know what left toes unable to move means?
A. No. The patient doesn't want to move her toes because it hurts to move, maybe they're swollen? I mean, she is moving everything else. She has good capillary refill --
Q. But capillary refill, you can have that because the arterial system is still intact?
A. Usually, if you have enough compromise is what I think you're getting at, to cause paralysis of the toes then you usually compromise the capillary circulation before you have that.

Q. You've got a doctor who is saying, she says is not moving her toes well this a.m. and a nurse saying at 2 o'clock that same thing, not being able to move the toes, and you don't find that at all concerning?

A. Could be a little concern. I'm not terribly concerned about it, to be honest with you. Toes are not a problem.

Q. Doctor, you're saying this knowing that the next day she's got compartment pressures that are elevated and looking back and seeing this kind of note, none of this is a concern to a doctor?

12:14P A. No; I'll tell you, because in a compartment syndrome I've never seen or heard of actually making that the diagnosis because you can't move the toes. Usually you worry about a peroneal nerve palsy; you can develop foot drops; you have severe paresthesia, numbness, things of that nature, but not being able to wiggle the toes, it really does not in, and a very edematous foot gives me very little concern.

Q. Do you see under social where it says the nurse indicates that Rachel is crying and laughing and pushing the M804 button frequently?

A. Yeah, I do.

Q. And you don't put all that together and -- I see you're smiling.

A. Well, I mean, it's almost a ridiculous note; crying, laughing. Maybe she is hallucinating on drugs.

Q. Maybe she's in a lot of pain and can't move?

MR. MURPHY: We're getting argumentative, Kerry.

BY MR. VOLSKY:

Q. Someone is in increased pain and all these signs fit together, could be evidence a compartment syndrome developing, couldn't it?

A. Unlikely. If, when I read those notes there's nothing about these notes that, with the exception of those which, as I just pointed out, really don't concern me that would make me think of compartment syndrome and laughing, I don't know why that would indicate pain; why is she laughing?

Q. She's hysterical because she's been in a lot of pain.

MS. BOSELLI: Objection.

A. Believe me, when I say I have never in my 20 years of doing this had a patient in so much pain that they started laughing, ever. I don't care how much morphine they're taking.

Q. You indicate in your report that the over-heparization that took place in the first twelve hours after surgery would have precipitated a massive

hemorrhage which would have been noted immediately. If it had occurred. Do you have your report?

A. Can I? Let me look a second.

12:16P Okay. I'm reading it. It's the last paragraph.

Q. Why do you say that?

A. I don't understand the question why do I say that? That's the way I feel; in other words, there should have been evidence of massive hemorrhage at the time of operation on the 14th. There should have been evidence of massive hemorrhage even before that, and there just never was. Nobody describes any massive hemorrhage.

Q. What kind of timeframe are you referring to as to when the massive hemorrhage should have occurred had it been from the over-heparinization?

A. At the time that they over-heparinization occurred.

12:17P Q. You would have expected immediately?

A. If it were going to occur, yes.

Q. Why couldn't it have been a slow bleed?

A. Why couldn't it have been a slow bleed? I mean I'm not quite sure I understand what you mean.

Q. You're saying that you would have expected massive hemorrhage right away, and I'm asking you why.

A. I said if there were a massive hemorrhage you would expect it. I'm saying there wasn't a massive hemorrhage.

Q. I understand that. If this compartment syndrome was caused by the bleed, could it have been a slow bleed that developed over days?

A. I suppose. It's unlikely.

Q. Again referring to the top of page 32, paragraph right above where we were before.

A. Am I, where?

Q. In your report.

12:18P A. Okay.

Q. You make a statement talking about unusual circumstances. What were the unusual circumstances involving the anatomy and pathophysiology of Rachel Koch's left lower extremity that you're referring to?

A. Well, the fact that she had a venous malformation is an unusual circumstance to begin with, and then in my opinion the actual venous outflow occlusion had developed is an unusual circumstance also and that's all related to her anatomy, which was abnormal to begin with, i.e., the varix and then, of course, all the subsequent problems that developed.

MR. VOLSKY: All right. Thank you. That's all I have.

MS. BOSELLI: I just have one quick question.

EXAMINATION OF HOWARD C. PITLUK, M.D.,

BY MS. BUZELLI:

Q. You've reviewed in addition to the attending notes the residents' notes, right, in this case?

A. I've reviewed the notes in the chart, is that what you're referring to?

Q. Right.

A. Yes.

12:19P Q. And my question is to you whether you have an opinion as to whether any of the acts or omissions by any of the residents who were involved in Rachel Koch's care caused or contributed to her amputation?

A. Yes.

Q. What is your opinion?

A. My opinion is that they had no contribution to her amputation.

MS. BOSELLI: That's all I have.

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State of Ohio) **ss.**
County of Cuyahoga)

CERTIFICATE

I, Susan W. Talton, a Notary Public within and for the State aforesaid, duly commissioned and qualified, do hereby certify that the above-named witness, HOWARD C. PITLUK, M.D., was by me first duly sworn to testify the truth, the whole truth and nothing but the truth in the cause aforesaid; that the testimony then given by him was by me reduced to stenotypy in the presence of said witness, afterwards transcribed upon a computer; that the foregoing is a true and correct transcript of the testimony so given by him as aforesaid, and that this deposition was taken at the time and place in the foregoing caption specified.

I do further certify that I am not a relative, employee or attorney of any of the parties hereto, and further that I am not a relative or employee of any attorney or counsel employed by the parties hereto or financially interested in the action.

IN WITNESS WHEREOF, I have hereunto set my hand this ** day of May, 1994.

Susan W. Talton (DB)

Susan W. Talton
Notary Public

My commission expires February 25, 1995.

SIGNATURE PAGE

_____

RACHEL KOCH, a minor, et al.,

I certify that this deposition was signed in my presence by RACHEL KOCH, a minor, et al., on this_____ day of _____, 1994.

IN WITNESS WHEREOF, I have hereunto set my hand And affixed my seal of office in this City Of_____, County of_____,

on this _____ day of_____, 1994.

_____
Notary Public
My commission expires:

RACHEL KOCH, a minor, et al., **vs. PETER SCOLES,** M.D., et al.,
Case Number 188233 **Judge** Calabrese
Deposition Date Friday, May **13, 1994**

I, HOWARD C. **PITLUK,** M.D., **wish** to make the following changes:

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