[MUSIC PLAYING]

ANGELA O'NEAL: So my objectives today are to review some of the anatomy, discuss some of the risk factors, and review the clinical findings of postpartum neuropathy. And Dr. Waters has set me up perfectly for this. So he did most of my talk, but I'll try to bring up a few points.

So first of all, postpartum neuropathy, the incidence is really not all that high. It's about 4% of all deliveries, and the risk factors are small mom, big baby, big head, and positioning that prolonged second stage of labor, and instrumentation. Those are the most common risk factors for this.

What we usually think about is-- we have what I'd call the acquisition heuristics. Somebody comes in, puts a needle in your back-- It must be that anesthesiologist that caused this neuropathy, and it's really unlikely to be the anesthesiologist. And the anesthesiologists almost always get called first to see these patients, which I find is really interesting, because it's almost never related to neural axial complications.

The most commonly affected nerve is the latter cutaneous femoral nerve, followed by the femoral nerve, then peroneal nerve. And the least commonly affected nerve is the obturator nerve. I'm just going to remind people of a bit about neuroanatomy. So first of all, intramedullary lesions, that is cord lesions, are usually painless except if it involves meninges or the blood vessels. Cauda equine-- remember that's a polyradicular problem, so they're going to have pain in multiple roots, sensory loss in multiple roots, loss of reflexes-- And as opposed to conus medullaris lesion, which is painless saddle anesthesia, and bowel and bladder dysfunction early.

Radiculopathy. So quickly, the L1/L2 roots are very rarely affected. 2/3 is a weakness involving hip flexors, knee extensors, and medial calf and thigh sensory loss. L5, foot drop-- and we'll go through that quickly in a little bit.

And then plexopathies-- Well, the first four lumbar roots, the anterior rami make up the nerves that have to do with the ilioinguinal nerve, the iliohypogly-- hypophyseal nerve, and the general femoral nerve, femoral lateral cutaneous, and the obturator nerve. So most of the nerves that have to do with medial thigh. And the lower plexus mostly is sciatic and pudendal nerve.

So Dr. Waters showed a very graphic depiction of why these nerves get compressed, but the lateral femoral nerve usually gets compressed here at the inguinal ligament. And the femoral nerve, of course, is most commonly compressed at the inguinal ligament. It can get irritated or damaged retroperitoneally, but that's much less common in this population. The obturator nerve at the pelvic brim and the sciatic nerve is either because of stretching or positioning.

Just remind you that the sciatic nerve has really two nerves together, the tibial nerve and the posterior tib. The perineal nerve allows you to dorsiflex your foot and also to evert. And the way to tell a sciatic neuropathy from a peroneal neuropathy is that you're going to have plantar flexure weakness and inverter weakness with the sciatic nerve. And if you remember the gastroc is the strongest muscle in your body. So the way to tell is not to test the planter flexion, but to test inversion.

The pathophysiology, just briefly. These women have a really great prognosis, and that's because the injury is either a nerve compression or a stretch injury at a vulnerable site. And so what happens is there's a local demyelination, and then what occurs secondary to that is you lose saltatory conduction. You may have a conduction block, but the axons for the most part are intact, and therefore they have an excellent prognosis. And it may take days or even weeks, often, before they return to normal but their prognosis is excellent. That's different than if it's a spinal cord injury, of course.

So I'm going to spend the rest of my talk just going through some cases. So now that you know everything about the nerves to the legs, and you can work this out yourself. So these are all real cases.

This is a 33-year-old lady. She's G3, P3. And she presents to our service for evaluation of pain. She had normal spontaneous vaginal delivery with epidural analgesia. The epidural had required multiple attempts, and then when she got up from sitting she had this brief electrical shock sensation that went from her lower thoracic spine all the way to the occiput. That's a Lhermitte's sign. And she's afebrile. Again, with neck flexion, she'll have that shock like sensation-- and Kernig's signs. So the only thing that we have on exam is that she has this Lhermitte's sign, which is an indication of some sort of irritation to the posterior column.

And here is her imaging. These are T2 images, axial and sagittal. And the green arrows-- I hope they show up-- are to show methemoglobin. So on T2 images methemoglobin is dark, and so she has subacute blood in the subdural space. So in this instance, clearly the blood was related to the epidural technique. There's other causes for blood in this kind of situation, but this is clearly what happened.

And then, as opposed to the epidural hematoma that Dr. Waters presented, this lady has a normal neurologic exam, and so, needs no surgical intervention. The blood's going to be reabsorbed, and she did just perfectly.

Case two, this is a 30-year-old lady. She's G5, P5. And she has a postural headache one day after spontaneous vaginal delivery with combined spinal epidural analgesia. And so she got a blood patch, OK. And we have already heard the description of what a blood patch is. She came to our service in postpartum day five because she had a fever of 38.5, she had low back pain, and with neck flexion she had a lot of pain. She had a positive straight leg raising, right more than left, and then she had saddle anesthesia.

So what she has on exam-- So she has a fever. She has meningeal irritation. She has something that's irritating the lower roots, because of straight leg raising. And then she has, probably, sacral route involvement as well with the saddle anesthesia. And here's her MR. On your right is the T1, and then the T2 images. And blood is bright on the T1 and dark on the T2, and so you can see blood in her subarachnoid space. So the reason that she had fever and root irritation was because of the blood patch. The blood got into the subarachnoid space.

OK, case three. She's G3, P3, three weeks postpartum, and she comes to the clinic. I have an OB clinic. She came to my OB clinic because she has pain that goes from her groin into her thigh, she has thigh doesn't have it-- she has some back pain but no radicular component to that pain. And on exam, the only thing that she has is pain over the lateral-- pain and numbness over the lateral thigh.

And this is, as Dr. Mark Waters mentioned, is the most common neuropathy that we see postpartum. This is a lateral femoral cutaneous neuropathy. The findings are pathognomonic. If you have sensory loss that respects the mid-line, that's what it is. No imaging is needed and risk factors are the same. Large baby, positioning, and instrumentation. And treatment, I mean, these do generally get better. You can use just simple analgesics, non-steroidal-- Lidoderm patches work-- and then if their pain is really intractable our anesthesia colleagues can do a nice block for us.

32-year-old lady. She's G1, P1. She has leg weakness two days postpartum. She actually had an uneventful vaginal delivery of about a 3.3 kilogram baby with epidural analgesia. She has right leg numbness and weakness, and her leg buckled, and she fell. When you see her, she has weakness in hip flexion as well as knee extension, diminished patella reflex-- she doesn't have any back pain with range of motion-- and she has some tenderness over the inguinal ligament. And so this is-- And, of course-- first question she asked me is, "Did this happen because of my epidural?" And the answer was no. And she had a femoral neuropathy.

So this is the second most common nerve impingement, about three in 100,000. 25% of them are bilateral and that is simply because of positioning as well, or a large baby. The findings are, as depicted in this case, where they'll have hip flexor and knee extension weakness, sensory loss in the medial thigh and medial calf. And we talked about risk factors. All right.

32-year-old lady. She's eight weeks postpartum. She has leg pain, and numbness, and weakness. Again, she thought it was related to the epidural anesthesia. And she had had a c-section for non re-assuring fetal status, and she has weakness of leg below the knee, and it's aggravated by crossing her legs. She does have back pain-- that's almost universal postpartum-- no radicular pain, and then she has weakness in her anterior tibs and extensor hallucis, evertor weakness-- but inverter strength is strong, her reflexes are normal. And she has a Tinel's over the peroneal nerve at the fibular head.

So this lady has a perineal neuropathy. Again, no need to image. What this, obviously-- The major issue with somebody who presents with foot drop here is, is this a nerve root, is this a plexus, or is it a sciatic nerve problem, or is it a peroneal neuropathy? The mechanism, as we've already heard, is related to the lithotomy position or extensive knee flexion, and the treatment is simply supportive. But they need an AFO brace so they don't trip and fall. And they generally all get better.

The sciatic nerve can be injured by stretch or compression, but it's much less common, and the findings I think we went through. The difference is that the sciatic nerve is going to have weakness. They're going to have knee flexor weakness, and they're also going to have weakness in the hip abductors-- excuse me-- They won't have weakness in the hip abductors. If they do have a hip abductor weakness, that says it's more proximal, either a plexopathy or a root problem because those come off-- the inferior and superior gluteal nerves come off the-- high up on the plexus. All right.

So this lady, she has weakness in her-- So she had several hours of labor pain, and she had pain in her groin and medial thigh, and then she got the epidural and that went away. And so then, she underwent an emergency c-section, and then she has some difficulty walking the next day. And what she has is, she has weakness of thigh adductors. I call those the muscles of contraception. She has weakness bringing her legs together. That's to help you remember it.

So she has weakness of the adductors, and she has a diminished adductor reflex, and sensory losses over a tiny area in the medial thigh. So she actually had an MR of her spine and there was no nerve root compression seen. And this is the obturator nerve, OK? And these people-- so it's the least common, it's often compressed at the pelvic brim-- These people will have weakness in adductors, and they often walk with a circumduction kind of gait because they have unopposed abductor-- And again, this study by Sorensen, they looked at patients who had operator and neuropathy over 25 years-- this, from the Mayo Clinic-- and almost universally they had a good outcome. So, all right.

So this is a little more complicated. The lady, she's one day postpartum. J1, P1. She has pain and tingling in both legs, and she has a lot of trouble standing, difficulty emptying her bladder. She had an uncomplicated vaginal delivery. Her son was 9 pounds. She did get epidural anesthesia. Then-- So she's short, she's five feet tall, and she has bilateral leg weakness in multiple nerve distributions. She has flexion weakness bilaterally, hip abduction weakness, adduction weakness, and she does have some weakness distally as well, and a sensory exam that looks like it's multiple dermatomal too. So the question is, is this a cauda equi-- is this multiple-- is this cauda equina? It's less likely to be [INAUDIBLE] conus. Or is this a plexopathy?

And after imaging and EMG study, it turns out to be a bilateral plexopathy. So this can be very difficult to distinguish from a cauda equina lesion. Most of the time we're going to probably do imaging because it's hard to distinguish. Our EMG colleagues can help us a lot if they don't find any paraspinal abnormalities. They shouldn't have as much back pain, but they can have a lot of hip and leg pain. So it can be hard to distinguish. And again the risk factors are big baby, small mom, big head of baby, and a prolonged second stage, and instrumentation.

I want to talk about the pudendal nerve for a couple of minutes because I think it's under-recognized cause of neuropathy. The pudendal nerve comes off the sciatic plexus-- sacral plexus-- and it sort of has a circuitous route through the plexus-- through the greater sciatic notch, then the inferior sciatic foramen-- and then it comes out through this canal called the Alcock's canal. These people will have-- These women will have pain, they'll have perineal sensory loss, and bowel and bladder problems.

And how does it distinguish this from a conus lesion? Conus lesions are usually painless. And these women have a lot of pain when they sit-- you can see why they might have pain when they sit-- and same risk factors as all of the other postpartum neuropathies.

So it's tough because postpartum a lot of women will have trouble with urinary incontinence and other things, because of local trauma. But if these things are persistent, you really need to think about this. Quickly, approach to stu-- When do you image? Well, just like when we heard from the headache people-- if there's any red flags. So, to me, red flags would be a person who has a coagulopathy, a woman who has an underlying immunodeficiency-- that it doesn't have a clear peripheral problem-- unexplained bowel or bladder, motor findings that are in upper motor neuron or chord pattern, sensory things in an upper motor neuron or chord pattern. Concerning things. Fever. Severe pain. Sort of the jump-off-the-bed pain that, when you palpate, that an abscess would have.

And then the ones that are the least concerning are these peripheral nerve problems, where you could clearly say that this is a peripheral nerve and has nothing to do with epidural anesthesia. If it is a plexus, you're probably going to want to image. You may want to image both plexus and back depending on how confident you are in your findings.

So my take home points are that these neuropathies are frequently related, or almost always caused by compressive trauma. It's very rarely related to the neural axial anesthesia. And I was one of those people who called their anesthesiologist a god because I loved it. The first good night's sleep I ever had was the night I had my twins. And diagnosis is usually made by careful history and exam, and the prognosis is excellent. And that's all I have to say, thanks.

[APPLAUSE]