

## 361R- Spinal Surgery with David Baxter

Steven Bruce

Hey Well, good evening. Welcome to today's extra evening CPD broadcast. As you probably know, we'd normally run a lunchtime case based discussion on the second Wednesday of the month. But today was the only day that my guest was available. And I'm afraid we just leapt at the chance to get him on the show. What drew him to my attention was a press release based on this NHS article here, which as you can see talks all about micro discectomy and pioneering surgery and David Baxter. So of course, I looked him up. And I discovered that not only is he a military man, which immediately endeared him to me, of course, but his medical interests include sports and exercise medicine, as well as non surgical treatment for back pain. As you might expect, he does a lot of work with the defence medical rehabilitation centre where he sees a huge number of cases, many of which are probably the sort of thing that you yourself will be seeing in your own clinic. So I reckon there's a lot we can learn from him. Colonel Baxter, welcome to a VM. Great to have you in the studio. Thank you. Thanks very much for having me. I've, I've made the assumption, you see a lot of things that a physiotherapist or chiropractor and osteopath will see in their clinic, because although you're a consultant neurosurgeon, actually, I mean, you see a lot of people who don't need surgery, don't you say? Can you describe the sort of range of things that come across your desk?

David Baxter

Yeah. So as you say, I'm a consultant neurosurgeon and neurosurgery treats both cranial conditions and spinal conditions. Within the elective realm of what I trade, so there's obviously on call work which involve cancer and trauma. Within the elective realm, the majority of things are our lumbar and cervical degenerative conditions. So typically, I'm talking about things like lumbar disc prolapse is foraminal, stenosis, lumbar stenosis, causing neurogenic claudication. And all of those things would present tend to present with back pain and leg pain. And also the same sort of conditions in the in the cervical spine. So sabbatical from Huddlestonosis, causing unpaid and when the disc is more central, causing causing malapropism

Steven Bruce

and the article that I saw that press release from the NHS and this pioneering work and micro diskectomy um, is it really that much of an advanced, very recent news, so

David Baxter

that was the that was the article, covering Kettering hospital starting endoscopic spinal surgery. And that that's actually been going for about 20 to 30 years around the world, mainly mainly in Asia, but in parts of Germany as well. 70 to 80% of spinal surgeries performed this way. The reason for that is because there's very little tissue damage, very little blood loss. And that always struck me as being one of the main problems with surgery that we do so much damage to get to the point that we're trying to get to. So this minimises a lot of that. And, therefore, particularly well suited to big patients physically big patients, whether that be because they're muscly, or because they're obese, and also too frail people. So we know that those are two groups that actually don't do well in traditional surgical pathways. Surgeons tend to be reticent about operating on the As they get older because their risk of, of managing complications is is higher. So for me it's been a game changer. It's starting to be taken up more widely in the UK now I think when I started the service with Michael McCallum at the Royal National Orthopaedic Hospital three years ago, we were the fourth centre to start since then a further 10 have bought the equipment and are looking to start now and and that was why you start articles written because I came over to kettering to join the team there and help support them through their first cases

Steven Bruce

arise. So they just set up a new centre at Kettering. Right, and when we talk about this, this new approach to endoscopic surgery, how much of a how much damage you're causing?

David Baxter

Well, the endoscopes vary in size in the in the neck in the cervical spine scopes are four millimetres in diameter. And in the lumbar spine, they're either six or eight millimetres in diameter. So about the size of a sort of a pen, a big pen, and some of that we will have some videos if there's an opportunity to show you show the audience later. Oh, yeah, they're going to be doing see that. That's all done. The view point is through the endoscope. So although it occupies the whole screen, and certainly in my in my operating theatre, I've got a big screen that I can see what I'm doing. I'm actually that's only six millimetres across the much less tissue. I

Steven Bruce

think you've got a picture of a natural scar from all of these apps as well, who knew so yeah. One thing that might puzzle some of the audience, I've introduced you, you're a military neurosurgeon, so is the population you're seeing representative of the general public? Are you only seeing fit young men and women?

David Baxter

Well, remember, I'm in NHS surgeon as well. So although my employer is in the military, I, the last four years, I've been at the Royal National Orthopaedic Hospital. I've recently moved to the Whittington Hospital in, in North London. So I see I see civilians as well. The military are slightly different population. We tend to have higher rates of lumbar degenerative disease, because of the kind of work that we do. And we tend to be a little bit better. Yeah,

Steven Bruce

yeah. Okay. And I presume that you know, you're you're paid by the military working in the NHS because the NHS leave, the military can't afford to have surgeons surgeons getting no practice.

David Baxter

Exactly. Actually, going back to your previous point, there is a slight Another difference with the demographic as well, and that's in the military. We've got fantastic rehab and rehab with physiotherapists, arrows. And so probably the biggest thing that I noticed is that the soldiers come having done a rehab course already. They have surgery and or an injection or whatever. It's usually joint decision making, actually. So I brought a very close relationship with an SEM consultant, Mark Cranley, up at the MRC and some of the physiotherapists there, and we will, they'll know what I can do and vice versa. Yeah. And we'll we'll come up with a sort of a plan to how we're going to treat somebody and it's very joined up. And that really is that's a bit of a treat to have.

Steven Bruce

Yeah, I imagine it is. And what's what's more, you've got a population that does as it's told, by and large, I learned, because most of the time, they don't really have a choice. Most medical things they do, but if they're told to go and do rehab or prehab, then they will.

David Baxter

Well and and, I mean, that makes it sound as though they're forced to do it, but they are their work enables them to do yes, you know, duty to go whereas I think people people in civilian sector would find it difficult

Steven Bruce

to do this in their spare time after work makes it much more difficult. The facilities at the defence Rehab Centre, which is where now stand more Hall, it's

David Baxter

DMRC, the defence Medical Rehabilitation Centre at Stanford, Stanford Hall, which is just outside Lutter and Headley if you remember the call, which was based down in Asheville, I think that that all moved up to to Loughborough about five or six years ago.

Steven Bruce

So when when a military person of whichever stripe goes up there for their prehab what is there a general protocol for lumbar before lumbar spinal surgery.

David Baxter

So there's there's a, there are two spines courses there's there's neck and lumbar spine surgery and lumbar spine, of course. They'll come in they'll see. Concurrently sports and exercise medicine consultant, as well as a group of the physiotherapists. They'll have a medication review. They have a physical assessment, they'll have exercises that are delivered to them and then normally they're in for a week. A week long course sometimes two with a with a weekend break in the middle and during which time they are working towards various goals ultimately to complete the test when

Steven Bruce

we of course, right before surgery. Yeah, yeah, of course. I was expecting it will be a sort of a month To try and build up muscles so that you have something to come back to after the surgery has taken place. So

David Baxter

I think back in the Headley court days, people had longer there. And I think I remember I had a knee up and I had two or three weeks of prehab. But they're not expected to achieve everything in that week, that week as part of education and training, and then they go away, and then they do that themselves. So I'm just

Steven Bruce

thinking rather than that old expression about policemen, criminals are getting younger these days, because when I had my knee done back in rnh Hasler in the day, they didn't give me any prehab, or anything like that, no, they they gave me any rehab, either. It was in take the whole bloody meniscus out, and that was it back on the streets. Yeah, it was very primitive. Yeah. Interesting. Do you know, a an orthopaedic consultant, Bill ribbons. I know the name but I don't know. I think it's one of the early members of the sports exercise medicine fraternity, if you like we had him on the show a little while ago. But I mean, it's of no relevance to this evening, but I just thought you might have had a question coming in from Govinda. Her question is she has a 64 year old male you'll get fewer of these probably people who've got patients that they want advice on so hope you don't mind. 64 year old male patient with severe persistent low back pain and sciatic pain, no quarter recliner symptoms, sequestration, L one, two, which is resolving and severe degenerative disc disease or L one to five, getting to a stage that it's nearly fusing. There's some disc integrity L five s one that is

protruding into the canal causing stenosis, he has Crohn's and is mildly osteoporotic. He had a spinal injection six months ago, minimum relief, osteopathic treatment doesn't really help. So a spinal consultant this week, who's suggesting surgery, left sideline and make laminectomy at L five s one and to put screws in to stabilise and fuse that side, given the integrity of the rest of his spine, what would be your opinion, that's a really difficult one without seeing the patient and the answer and everything else.

David Baxter

But that's, that's very difficult without seeing the patient and knowing the details. So perhaps it's better to just think about principles that I would employ when approaching a patient like that, rather than speaking about that specific case. 64 years old, with that advanced degenerative disease, I'd want to make sure there wasn't an underlying axial spondyloarthritis. So when you mentioned, when you mentioned, almost fused, I look at the imaging and just make sure that there isn't some other immune rheumatological problem that was going on that was causing it or diffusing, especially in the context of having Crohn's and I would work hard to find out what the pain generator is. So typically, in addition to examination and an MRI scan, I would do diagnostic injections. And those are to target the the nerve root that's causing the problem, especially in somebody who's got multiple levels of problems. And then I would also do a medial bundle branch blocks of the set joints that I think were affected, to give the patient an idea of what I would hope to achieve with any surgery. So those are the kinds of things I do beforehand, check that those have been done. fusion surgery is good in if necessary, is good for certain conditions. But I would also just be wary because it can accelerate degeneration at the adjacent levels later on. And of course, if somebody's osteopenic, osteoporotic, you've got to be careful about instrumenting the spine because they can cause problems between bone, the bone, I was

Steven Bruce

going to ask what you do in cases of osteoporosis because if there's nothing to screw into, do you do fill it up with some sort of compound to give it a bit more bulk instability. Try

David Baxter

not to start from there is what I do so I work closely with rheumatologists. Treat people with bisphosphonates or where appropriate teriparatide beforehand to try and avoid surgery. And again, I'm I try to avoid doing fusion operations where I am instrumenting the spine, just as a principle, one of the exciting things about endoscopic surgery is that is that you can often just shave wear a little bit of bone, you can often do something much more minimally invasive. And that avoids changing the spine. So yeah, those are just that's the kind of the way I would think about that. Okay, so

Steven Bruce

we'll hopefully come in to found that useful and interesting. But you can't expect the full answer on a patient without using the patient in front of you will always imaging and this is not about spinal surgery, but Sue's asked a question which I have a personal interest in as well. She wants to know

about the military covenant. Should we refer military or veteran patients to some specific rather than their GP? You might have to explain what the covenant is for those who are not connected.

David Baxter

Yes, so it's a really interesting and timely question. The military covenant essentially essentially It reflects the promise that society will look after it's it's serving personnel and veterans. And a part of that is medical care. But it extends beyond that. It's also trying to avoid things like homelessness and people, once they leave the surface can get access to jobs, etc. Aren't penalised for having served within the military. So Should people be treated? Should veterans be treated? Or should serving personnel be treated by military medics? Not necessarily. But there are some advantages and disadvantages. And if your audience are not aware, there are two programmes at the moment. One is called the BCHA is the veterans covenant Health Care Alliance, and the Vita and the Veterans trauma network that are two similar initiatives whereby hospitals sign up they have to abide by a certain set of guidelines, in terms of making, trying to identify that they're part of that to any people that come out that are veterans and signposting veteran services for them, and providing information that perhaps wouldn't be available to others. So it's sort of a signposting guarding service for veterans. And then within the veterans trauma network, consultants who are aligned to it will be contacted about for example, in my case, I was contacted about a patient who needed a cranioplasty which is a which is a metal plate that covers a hole in the skull needed revision surgery for that. And I was able to navigate the sort of the neurosurgical NHS landscape for them. So those are two initiatives that I would encourage your your viewers listeners to tell us,

Steven Bruce

they should look those up, and then they can point their patients in the direction of one or other of those trust.

David Baxter

Exactly. I think I think that we give the military doctors or military surgeons understand the roles that the people were treating do. And so this isn't the home base in in the UK, we understand the roles that they do so we're able to offer occupationally informed advice. And an example how that would be relevant in my practice is that we reduce the number of spinal fusions, quite by quite a lot. Because we recognise that it wasn't easy to continue on in service after having had a spinal fusion. So we, because of the disruption to patch spinal muscles, and because of adjacent segment disease, that kind of thing. So we were able to advise personnel earlier that, you know, perhaps, perhaps there's a different way to treat this. So that's, that's one example. On the other hand, we're still a small service, the British military and the defence, medical services are small. So we will have all the expertise. And so it shouldn't be exclusive, exclusively treated by military and I think we offer benefits in some situations.

Steven Bruce

One of those benefits might be that there's possibly more money available to the British military medics than there is to the standard NHS orthopaedic ward, I don't know. And I don't know why this occurs to me. No idea at all. But I'd just like to have a quick question about knee surgery. We had a surgeon on the show some time ago who specialises in bespoke knee replacements as opposed to off the shelf knee replacements and claims he gets better results as a result of that. Does that mean if you sent a veteran through one of those mechanisms you meant and they went to a military hospital they would have access to the latest in technology?

David Baxter

No, that wasn't what I meant. No.

Steven Bruce

Well, I was kind of thing he does the military have access to the latest technology but they were

David Baxter

so not exclusively so we don't we no longer have military hospitals as we did. As we did you know, when I first joined 20 plus years ago. We have Ministry of Defence hospital units. And those are in places like frimley Park Hospital in Catterick, James Cook in Middlesbrough. And probably the most well known, which isn't actually Ministry of Defence hospital unit, but it's still very closely aligned to the military is the world's Centre for defence medicine in Birmingham at the QEII hospital. And those are all fantastic, well equipped hospitals. But I'd say where we have the in within the medical services, the best equipment is probably within the rehab sphere, actually. And so, the MRC in Stanford Hall is just this fantastic facility.

Steven Bruce

My wife has just sent in a comment saying that the the cheap knee replacements for secondhand parts are really good these days. Thank you very much, Claire.

David Baxter

Well, interestingly, my my mother's just had a knee replacement. She's just like Last week so I, as you know, I'm a neurosurgeon, not an orthopaedic surgeon. So I'm seeing firsthand what knee surgery. Recovery is like. Yeah, yeah,

Steven Bruce

my wife's got a lot of comments to make about that when I had my last knee replacement, and I don't remember much of it, but I know it's pretty miserable for her because I was held to live with for three or four weeks that it went on. Maybe it was longer, I can't remember. Let's go back to your,

your profession, your your your expertise, lumbar surgery, what are the specific conditions that you see most of? And

David Baxter

so in general, the trigger to see a neurosurgeon is that you've got ridiculous pain, you've got pain going into your legs, or occasionally weakness, or worse, you've got pain, numbness, and in an emergency, better bowel sexual dysfunction. Those are caused by a variety of things in relatively young people, that tends to be because of a disc prolapse. And we talked about this earlier, there are various flavours of disc prolapse, there's an acute prolapse, where big big comes out, where I come on one of the slides we could talk about later. But then, sometimes you start to get a process where the disk itself starts to fail, and you get a broad based disk with a loss of height. And the nerves are then pinched either in the lateral recesses as the Transiting nerve crosses, or in the foramen as the exiting nerve gets caught. And that's probably one of the most common things I see. And because of the fact that the disc is failing, the facet joints at the back get put an increased load so that patients get back pain as well and extension based back pain as well. That's one of the most common lumbar conditions.

Steven Bruce

You saw me smiling while he was saying that it's nothing to do with what you were saying. He says that before we came on air, you you apologise to Paul, and said you were wearing bright socks. And I've just had a comment come in not to trivialise the context of this show, but you need to know there have been a number of comments about socks this year. So it's good to see that they have got their priorities, right, isn't it

David Baxter

and I wear these with pride. These were part of the pack of 24 socks that I was given by patients in my first Christmas as a consultant on call. And they had spinal cord compression, and we were able to treat them and they got better with no residual loss of function and his wife came into clinic very happy. And it turned out that they own the sock factory. So gave me gave me back 24th. And they're still going. Excellent.

Steven Bruce

Yeah, I should be able to get some of your imagery to so we can put into context, exactly what it is that you've been talking about so far. So what we got going on here. So this is a lumbar spine.

David Baxter

So on the left hand side here, you can see the sagittal image. So remember that I expect your your audience will be familiar with looking at these. But for those that aren't, this will be a sagittal plane. So you're cut down across the front looking across you and that's midline. Exactly, exactly. And that's midline. And so you're seeing the lumbar spine there with the top of the sacral spine. And discs in a



young person should look typically like this sort of with that black capsule around it, which at the front and the back of the spine is the annulus. The tough fibrous part of the disc, what we

Steven Bruce

typically see is a lot less of this white stuff in the middle, which is because that's the ones that come through MRI to. Exactly,

David Baxter

exactly. And what you can see at the bottom that between the L five and the S one disk, that that disk is less white. So it's got the nucleus, which is the most hydrated part of the disk has prolapsed.

Steven Bruce

We're talking just here. Exactly.

David Baxter

Yeah, exactly. Get the pointer. Nope. There we go.

Steven Bruce

Yeah, they're always a bit tricky. The service pointing devices. doesn't want to play. Okay.

David Baxter

What you can see is that the disc has lost height, which will narrow the foramen as well. And yeah, if we if you look, and there's this, this acute prolapse here that's pushing out the back so it's a L five s one paramedian disc bulge, and typically you'd expect that to cause left sided because the left hand side is one pain because the right so one nervous here the left is one that is squashed somewhere in there.

Steven Bruce

I've said that our audience will be familiar with the some of them will be very familiar with reading Mr. Imagery. Could you just on that term transverse segment the slice there, the white bits And to the south of the the disc itself. What are those?

David Baxter

These here? Yeah. So this is fat within the muscle. Okay. And we see this, I'd be interested to know what your experiences as well, we tend to see this increasing in people with chronic back pain. Yeah. And

Steven Bruce

well, I think possibly the trouble with this and we don't generally for most of our patients, we won't generally see the the imagery, because it's only if we think there's something that requires imaging that will send them off and a lot of our back pain patients don't meet that criteria. But I have we've had other people in here before who said, you know, what you get with, you know, long term with chronic back pain degenerative conditions, as you can see a lot more fat in the Para spinals. But there's also the reflections not good on the screen from my position here. But it looks to me as as big imbalance in the psoas muscles as well. And that one? Yeah, right. I'm thinking yeah, I

David Baxter

think I think that's fair.

Steven Bruce

Yeah. So again, if we get these things that we're looking at that may be thinking, well, something's causing that, and whether which is causing, which is effect is probably difficult to determine. In that stage, I wish you see all this disease, and there's gonna be some compensation, I imagine.

David Baxter

Yeah. Although, although one would expect, I think these kind of dis products is a relatively acute. And when you when you can see the tea to the whites inside it, I think that's a relatively acute thing. So I think I think that was probably leading, that sort of that was probably more recent. So one thing that you mentioned that was interesting was in terms of what caused it, I see, I see this prolapses as a consequence of, of bad spine mechanics. So for some reason, this disk has come under stress, and the disc has been forced out and drunk to to relieve pain or injections to relieve pain, even surgery to take out that this bit of disappointment doesn't address the underlying motion segment or abnormality. So key is then to work with, in my case, physios or MRIs to try and restore that either before or after surgery if they do have an operation. So

Steven Bruce

when you say poor mechanics, I'm when I'm thinking there were, there's another course there's a there's a military bloke who woman who's just picked up a hugely heavy load, usually in the form of a backpack with added ammunition and weapons and so on, which is putting a completely unnatural strain on the back, which it might not be prepared to handle, even if the mechanics are intact. And that might apply to bodybuilders or other people who use the gym a lot in our our clinics. But in terms of the poor mechanics, what do you what do you find? What are the poor mechanics? So

because we could be looking for these in advance, couldn't we to try and prevent this happening in the first place?

David Baxter

Yeah, I'm sure that you're, you'll be familiar with these these concepts already. But as you know, if you if you if your trunk is not both strong, but also controlled, the shape of your spine, the normal lordosis of your spine is not intact. And so the forces through the disc at each level, are, are increased if the if the spine the line is not correct. And then that's amplified if you if you rotate and bend down to pick something I'll pick that right. So I think about it in terms of muscle strength is muscle bulk. So do you have the muscle tone there sprint? Are you able to deliver the force there? And then movement control are they as your trunk working in, in one, to deliver force to transmit the force from your legs up and down and vice versa? And interestingly, you say that I see a lot of people with with disc problems. Most of them don't happen when they're putting on a heavy burden or bending over to pick something up. And then they do those things as well. So it's interesting to think, why that innocuous stretch, or bend young pick something up is the trigger for it. But without doubt, it's a combination of lots of micro injury exacerbated by one bigger injury,

Steven Bruce

I think. And I suppose a typical example we'd have in our own clinics is you know, people who say, well, it was I picked up put a sock on and that's where my back wind. But of course that isn't what caused the back to go it's something much more long term and you might understand this somebody I don't know who probably several people have been talking about a mucky duck and apparently you should know about this. Does that make sense to you mucky duck? I've got no idea. But it's nobody's explained it to me. So sorry. I'm afraid if you were one of these people who's talking about mucky ducks, you're gonna have to explain what that is because neither of us have the faintest idea. And Gianna says the the more fat the more deconditioned the muscles are as he understands it, is that that's correct. That's my thinking. Yeah, but as I say, we're just not going to see those images ourselves unless we've sent them off because there's some suspicion in our mind of a bulging disc or quarter Aquinas syndrome, something like that. Why? that view, because it's expensive, you know, I'll pay for it. Yes, they're paying for private medicine by and large, a lot of them won't come straight away because it's, it's an expense. Looking at the cost of what a standard lumbar MRI is gonna be, what, four or 500 quid, that's a lot of money to cough out, and they won't do it unless they think there's a real reason for it. And we would love to be able to say, yes, let's get one. Let's get an MRI. Let's see what's happening, but we just can't do it. Yeah. And in the NHS, it's it's easier, but it's not easy is it because it still has to be costed, it's probably easier within the defence.

David Baxter

So firstly, if you get an opportunity to look at MRI scans for your patients, I really encourage it. I look at every scan that I request, and I probably look at about 20 to 40 a day. And over time, your understanding of what's going on just amplifies massively. So I am a big advocate of even if you're not doing an intervention, so injections or or surgery, I think everyone learns by looking at scans.

Steven Bruce

Well, if I can just interrupt wearing, hold your thread there because you might be aware of a chap called Rob Shanks who has run a couple of MRI interpretation courses online and in the studio here. He's about to set up another one. And he hasn't let me know the details yet. So I'm going to publicise it for him, it'll be in London. But I thoroughly recommend it because he and Darren a colleague, they will put up a whole load of scans, and they'll show you things which have actually been missed by radiologists. And this is not to disparage radiologists, obviously, but I mean, if they're looking for one thing, they might not notice another and they've got hundreds to do in a day probably. But occasionally, even with the sort of more limited knowledge that we can develop, we can perhaps do something which is really important in terms of that patient's well being. So I'll keep you posted on that, because I'm sure Rob will let you know the days of that course very shortly.

David Baxter

Let me know as well.

Steven Bruce

So, of course, first of all, like

David Baxter

I think the only other thing I was going to say was that I have an advantage. It's it is relatively easy for a neurosurgeon to get a scan. And that that just does make things easier. You've got to still treat the patient without doubt. But when you're certainly when you're trying to pick which level that needs to be treated or whatever, I find it crucial.

Steven Bruce

So it was it was the crossover between orthopaedic surgery and neurosurgery when it comes to spinal work because surely, you're only going to do surgery. If there's some there's some pain, which involves a nerve, clearly. And there are spinal surgeons who don't describe themselves as neurosurgeons. So

David Baxter

there's a lot of overlap, and that that has changed and increased over the last 10 years because we're working more closely together. So at the Whittington hospital, we're combined Orthopaedic and neurosurgical unit the same way at the Royal National Orthopaedic Hospital. And there'll be lots of procedures that we do that are similar or to cover similar conditions. I would expect most spinal surgeons or or spine surgeons to treat this prolapses in some way or the other. I guess where we where we differ is that neurosurgeons treat intradural pathology. So once you open the thicker the bag around the spinal cord nerves, that is the remit of of neurosurgeons and that tends to be for things like tumours, so meningiomas in the spine or nerve sheath tumours or tumours within the the

substance of the spine itself. orthopaedic surgeons tend to treat paediatric deformity. I was fortunate enough to do a paediatric deformity fellowship. And you learn principles within that spinal alignment sorry, sagittal alignment principles behind fusion and spinal biomechanics that perhaps aren't emphasised as much in neurosurgical training. But there's a lot of overlap. Okay.

Steven Bruce

I've now been told the murky depths of pub, I didn't know why it's a public, you will be expected to know oh, well,

David Baxter

is it the what is it? Is it by Stanford Hall? There is a con by Stanford Hall. They

Steven Bruce

will that will be the case I'm sure. A Simon has two questions. He says many, many MRIs come back showing disabilities but not contacting the nerves. Therefore the conclusion is not relevant. And yet no account is taken that the patient was supine during the scan. He has a very good point. But if a patient was standing, surely it's possible that the bulge could contact the nerve. Secondly, what's your opinion of the significance of the inflammatory chemicals released by damaged discs and their effect on nerve pain even if the disc is nowhere near enough?

David Baxter

So to the first point, which is that I think we're talking about bulging discs that touch a nerve but don't compress it. And I think you're probably right Simon. I certainly think that, that the, the morphology of the disk will change in a loaded and unloaded state. That said I would confirm the diagnosis by doing an injection. And I also worked very hard not to do anything to that this because it might be at a critical stage where it's causing a little bit of no compression when loaded, but temporarily decompressing the nerve, by opening up the annulus might make things worse for you in the long term. So I'd look at other strategies like a deacon decompressing around it without touching the diff. There's something like a lateral recess decompression, where you take off the ligament above, but not, but not any different.

Steven Bruce

So you mentioned surgery around the annulus. Earlier on as well. What is the impact of backing into the annulus? How well does it heal?

David Baxter

Firstly, I try not to hack into the

Steven Bruce

and I'm a Royal Marine, that's what I would have done.

David Baxter

So yeah, the way I think about it is that the annulus acts as a physical container to keep the nucleus within the within the disk space. But it also prevents dehydration of this space, the loss of some of the water content of this space. And so hacking into it causes a problem for both those things. Firstly, you can you can have a recurrence, and the rate of recurrence is is most in the first 48 hours. But I've seen recurrence up to nine months after a micro diskectomy. And that's partly because the annulus is still weak, it doesn't have a good blood supply to it. So it heals slowly and never probably regains its full strength, but also because the underlying biomechanics about that motion segment are still abnormal. So you have increased forces through the deficits and more different amount and then the secondary effect even if there isn't a recurrence, it can accelerate the rate of the degeneration within the death. So you can you can the disc will wear out slightly faster. So yeah, I try I try to avoid opening the annulus unless unless I need to. So

Steven Bruce

in standard decompression surgery then if the disc was had to be trimmed away, does that mean that we'll always fuse that segment?

David Baxter

No. So typically when we talk about doing a micro diskectomy a very small amount of the disk is removed. So the the the two bony end plates in order to get a fusion need to be in quite close proximity to each other. And with the market escaped me, there's still a significant amount of this there. It's there to keep preserve motion, and they usually they won't use okay,

Steven Bruce

we've got your next case to solve in here from Beck's patient has a positive effects as a patient in early 30s. Who said emergency surgery for quarter Aquinas symptoms following a short term some presentation of disc symptoms. And the patient was awaiting an MRI before things escalated within a week she had what the consultant says is a re rupture. And that she had a very soft and she had very soft discs. The patient also has EDS and now has to catheterized to empty her bladder has bilateral leg pain and numbness and severely reduced I five s one dermatomes causing significantly altered gait. She wonders if you have any thoughts as to surgery for Pete for patients with H EDS. And all those that herniate following repair. Eds.

David Baxter

Ehlers Danlos Syndrome,

Steven Bruce

why H EDS. I know there are a number of types of EDs but

David Baxter

I'm not I'm not sure what the H stands for in that context. So I mean, that's we know that quarter corner is a an awful condition in it. And it really can wreck lots of young people's lives. It does write lots of young people's lives. If you're not our backs, I think it is if effects isn't familiar already, there are several quarter Aquinas services in the country. I'm familiar with one at St. George's Hospital and one at the Royal National Theatre hospital. And these are sort of super regional centres. So you may find that that the Royal National would consider seeing them. They're fantastic at managing some of the long term pain and your illogical problems. Lack of course, quite a bit that people left with called Aquinas syndrome have said we're looking at

Steven Bruce

so these are people post surgery where it's been too late and they've got the symptoms remain. Exactly,

David Baxter

exactly. And this is the problem with cortical I know that it tends to be very sudden onset. Typically we talked about bilateral sciatica with subtle paraesthesia anaesthesia and insensate you urinary retention, but it very rarely looks exactly like that every time, it's usually secondary to a large sequestered disc segment in the lower lumbar spine at four, five or five one. And for some reason, an acute prolapse that presses on the nerves is much less well tolerated than chronic compression that's built up over time, it's probably to do with collateralization of the blood supply. If the pressure builds up over time, more collaterals can develop, it's the way I think about it, if it's correct or not, but and so you get an acute disc prolapse, the nerves are pressed on, and you can be left with permanent dysfunction. The disc recurrence, unfortunately, is a known problem. It occurs in about one in 20, patients who haven't opened micro discectomy, about the same friend to scopic, maybe slightly less. And in surgery, we try to avoid it by checking within the disk base bringing other free fragments. And you can do that through irrigation or, or manually checking. But occasionally it can happen. The key thing is early recognition of it happening. And you can imagine this is quite tricky because somebody has caught Aquinas syndrome. So they've got these symptoms, we know that it doesn't always recover. And although we try to operate within 24 hours, that's the that's the sort of the, the the guidance. A lot of patients don't get better. So you take somebody to theatre, you do the surgery, and they don't get better is that because more disk has come out or because they weren't the people who weren't going to get better. And so I it's happened in my practice once or twice, not as a consultant actually, but as a as a trainee. And it's not as it's not always as easy to realise why it's happened and you'll you'll often end up scanning the patient, you'll operated at five o'clock the night before. They're not better that night and you think you're not sure whether or not it was because more disk has come out and you scan them the next day in the morning and more disk has come out you have to go back in again. It's not always straightforward. I

Steven Bruce

think quarter Equina Syndrome is one of the one of the things that really worries physical therapists because it's it's not easy to spot at a sufficiently early stage to make sure it can be dealt with safely. And we've we've done a number of shows about quarter requiring recognition and in particular the new national guidelines which are they get it right first time pathway. We have some really good advice and apologies for banging on about this yet again because I know I do it quite a lot. But we have some great advice from an osteopath James Booth. He's worked at the Queen's Medical Centre in Nottingham within their surgical team as an osteopath. And he said, you know, if you've got someone with quarter recliner, possible corner, Aquinas syndrome, synth symptoms, then you call the hospital and asked them to page the Encore spinal fellow and you ask him and him or her and they will have the team ready when the patient gets there as opposed to the patient who gets to a&e and a&e. Sometimes don't know what to do with someone who you've said is possibly called recoil.

David Baxter

Which is said Yeah, and I think those those guidelines, Briggs has sort of been a big driving force behind girth, those guidelines, and they've been endorsed by the British Association of spinal surgeon bats have really empowered people because they say that you need to have 24 hour MRI scanning available at centres that treat this, which and now that refers No, no this and doctors know this, they can sort of say actually, this is a treatment, this is the diagnostic capability that we need. Interestingly, you don't actually need 24 hour scans, you can these sort of emergency cases, what you can do is you can you can make them semi routine. So at hospitals I've worked at in the past. They'll have a slot at 730 in the morning, and a slot at 2pm in the afternoon dedicated for possible quarter granite. And it's a bonus if they don't have those scans to do. But it means that patients aren't waiting all day for a scan. The scans then done at eight or nine o'clock at night, and you're operating at midnight. And that used to happen during my training up until probably the early 2010 1112. I think why am I why am I doing this case this patient got to the hospital at at eight o'clock in the morning. They were in a&e for X amount of time then waiting for scan. Why am I doing it at one o'clock in the morning. If we if we work that process better. We could have been doing it at four in the afternoon or six in the evening

Steven Bruce

with less risk of adverse outcomes for

David Baxter

the patient. Exactly. Exactly.

Steven Bruce

I have of course I've just been told it's hypermobile Ehlers Danlos. And so I always think Ehlers Danlos as being a hypermobility disorder, but it isn't just that is it's Juniper says nearly every patient I



see with a disc lesion has both hypertonic superior backline, muscles, hamstrings, hamstrings and gastroc but also has pelvic misalignment. Is that a coincidence?

David Baxter

So, hi, could you repeat it the hyper hypertonic hyper or hypo hyper hypertonic? To their muscles that they defend? guarded? Yeah, oh, they're too tight, stiff

Steven Bruce

hands and guestbooks in particular mentioned here. And is that a coincidence that and it was a pelvic imbalance, wasn't it?

David Baxter

Yeah. You know, I'm not sure that I know the answer to that. I know that. Steve hamstrings and stiff thoracic muscles, definitely predisposed to lumbar back problems. But I don't know. I don't know exactly. Why the hypertonic muscles coming to that if that.

Steven Bruce

I didn't know if that is some of the the predisposing factor or the consequence of guarding because of pain. So in

David Baxter

this, I was wondering, Is that is that high? hypotonia. Is that a sign of guarding? Is that because we see that regularly? Yes. And so. So if you're talking about somebody who's got pain when you palpate those muscles, I would think of that as guarding. If it's somebody who doesn't have pain, but they're they've got high muscle tone, that might be something different.

Steven Bruce

Okay. Darcy says my surgical friends in London and Basingstoke are using more SPECT, MRI, and I didn't want to speak to them. So I'm sure you will for DISC assessment. For vertebral body and input pathology, is this the definitive imaging technique?

David Baxter

So I think it's SPECT CT rather than spectrum ri. That makes sense. Yeah. And essentially, it's a form of positive emission, CT scanning. We use it in in degenerative conditions where we're trying to demonstrate the pain generator, because you essentially get a CT scan overlaid with a an emission uptake scan. So essentially, you get a picture of the spine, and then you get some bright orange and

red spots usually have the facet joints or the end plates. And this, there's some, okay, evidence that this lines up with causes of back pain. It's not it is not definitive, and it's, and it's not universally used around, certainly we use it at. We used it at the Royal National Hospital Stanmore. I use it when I was there. But it's not necessarily use by all units and some neurosurgical units are better equivocal about the evidence for it. So unfortunately, unfortunately, there's not yet a scan for pain, you still need to, you still need to line up patient symptoms, physical examination, and then pieced together from the MRI and the CT. What's causing

Steven Bruce

one thing did come as a surprise to me the other day, I have a very recent patient who had asked if we could treat her using the spinal decompression machine that you've seen. And we looked at it, I looked at her MRIs and the radiology report, and I'm damned if I can see it. But the radiologist has said, bilateral past effects at L five, and a subsequent spinal consultant but then said, well, actually, I need a CT scan to confirm this. And I'd assume but if you can see it on MRI, then it's there.

David Baxter

Yeah, I think I think you can, you can often see positive effects on MRI, I would assume I mean, without knowing the specific case, it's difficult. It's difficult to know, but I will, it's

Steven Bruce

really about the role of CT and MRI that. Okay.

David Baxter

So I don't have a case. Case to remember from the slides. I may have a case. Yeah.

Steven Bruce

Just excuse us while we look through the slides for the one that's that we want. The right way. Yeah.

This is one of the penalties of doing these free flowing discussions that we have here that the slides are never in the order that we need them because we get on different avenues.

David Baxter

So what you can see here is the MRI scanner and a CT scan of the same patient. And you can see here, this isn't quite midline since we moved down to the level of Bremen, but what you can see here is the past effect. Yes. Now I didn't need a CT scanner to tell it the past the fact that you could tell because you can see there's a discontinuity in the past on this slice. Before I

Steven Bruce

look at MRIs, I that's a nice clear one where everything's lined up nicely. There's no bend in the spine or anything like that. I always find it really difficult to see that clarity to find the pause because it's all it all gets very murky and blurry.

David Baxter

It can do and especially if the patients have a degenerative scoliosis. So as you say, if it's curvy things aren't necessarily in the same plane. So what I do in those situations is I work with my radiologists. And we can use slightly different sequences of MRI scan that can look at the frame and better in the lumbar spine, I've not found the need to do that too much. But certainly in the cervical spine. imaging the framing is is notoriously difficult, right. So you can see here there's a past effect. So what what we'll be associated with that is, is a small spondylolisthesis. So a small slip forward. And the way I think about this, again, because the facets are no longer doing their job, more forces going through the disk, the disk over a period of time can then fail, you get a lot of discounts. And the the unit of spondylolisthesis of the bone slips board. The reason I get a scan is because remember, I'm a surgeon. So a part of my diagnostic one of the the the end results of the diagnostic workup is to offer surgery, not always, but often surgery. And in this case, this this patient had severe bilateral L five pain. And you do a CT scan to determine the the the operation the best operation that you can do. And in this case,

Steven Bruce

I mean that is very, very clear image of a past effect, though, isn't it, there's a big lump sticking independent in the US. And I should just point out the way we're looking here at L five s one there aren't we. And while you were pointing this was full screen so the audience couldn't see you pointing. So we might have to try your pointer and see if that little bubble will come up again. It's not the not playing the game. Just double tap it and see if it changes to anything. And again. Now we've lost it. So I'm sorry, we can't get the pointer to there, it's on that screen. So it's not there it is, it's just coming in from the right hand side, we got it.

David Baxter

There we go. So yeah, we're looking at the lumbar sacral spine in the sagittal plane. And you can see beautifully the past effect there, you can see that the facets can no longer do their job of restricting movement in the spine. The other thing that you can see, and this is one of the reasons to do the CT scan, is because there's often a bony osteophytes remember, this is this is a degenerative process that's happening over years usually. So there are active changes in the disc in the bone. And there's a bony osteophyte often in the frame. And and if you if you saw what we're looking

Steven Bruce

at here that little, that little that little speck of white

David Baxter

there is that is the start of one yes. And if you simply decompress that by putting a an artificial disc, and I don't do this, or I'm in a cage, a fusion cage in the disk space. And the point of that would be to increase the height, the nominal height and allow fusion to occur, if you simply say, so the framing of the back will then be bigger, similar to the height above. But if you do that, and don't appreciate that there's only space within the frame and you can crush the nerve and make the leg pain worse. So CT scan gives you a better understanding of the bony anatomy. And I use it in all patients with a with this kind of pathology as part of the surgical workup. If we're going to go after surgery,

Steven Bruce

or waiting times in the NHS as bad for this as they are for most other things.

David Baxter

I think it depends on the unit. And and there are lots of initiatives to try and reduce the the wait time. But unfortunately, this this is an elective condition. So although it's causing severe pain, it's not cancer, it's not heart disease, it won't kill the patient. And I think I think you know, you could probably wait at least six to nine months, having been having been worked up prior to surgery. And that might be different in other people's practices. I'm not

Steven Bruce

it's a long time for that patient who's in severe pain, there we

David Baxter

go, you may in that period have prehab you may in that period have injections, you'd certainly be treated with neuropathic pain medication. So But nonetheless, it's a long time. Yeah. It's also actually I don't want to I don't want to necessarily go down the road and say well, actually we should we should we be treating people with these conditions too quickly. spinal fusions have a consequence and you know, often quite invasive surgery. The way I do this is with a vascular access surgeon and with a small Pfannenstiel incision at the front retroperitoneal approach and then removing that disc and putting a it's called an anterior lumbar interbody cage in it And then with some screws in the back to make everything stronger. And surgery has risks, but even more screws

Steven Bruce

in the back. So you're doing a anterior approach and a posterior approach to the same yes

David Baxter

to the tooth in two separate settings, or, or one after the other not not at this man the same time. So usually the front first back cage is locked in place with a screw or plate at the front. But you're asking a lot of work from a from an artificial construct metal construct, and over time, that can fail, especially when there is no support at the bank because the past is not intact. So I'd also do screws at L five and S one and create a fusion at the back to make the whole construct stronger. I do that with a vascular access surgeon. Because they're much better at dealing with the retroperitoneal or the approach than I

Steven Bruce

am. And you fill up the gap between the vertebrae. Yes,

David Baxter

yeah. So we had to use a biological agent. Or if there's bone autologous bone available, then that's the preference. Yes.

Steven Bruce

A spinal surgeon has been a consultant who came on the show some time ago said that that biological agent is was referred to as muda muda gets mashed up dead Americans. Because apparently, when the surgery was developed in America, that's what they were using. Basically, it was mashed up bone from people in there longer needed and tray tariffs are he says I believe this prolapses that are not compromising a nerve root or the spinal cord and therefore don't require surgery can resolve will be gobbled up by macrophages over time. Can you confirm this? And if so, how long does it take?

David Baxter

Yes, that definitely happens. And it takes a variable amount of time. I don't know exactly what the factors are. But like from my observation, when the prolapse material or material is that very grey on T two nucleus, the reabsorption tends to be faster. Anecdotally, you'd think it was in that sort of six to eight week period when people get better on their own before they've had a scan? And I've certainly seen cases of very big disc prolapse is that look like they should cause quarter quarter but clinically weren't because then they'd have had surgery in patients who absolutely didn't want surgery, and borrowing them up over six months in the year. And the scans only improve that about between the six month and the year stage.

Steven Bruce

It's a curious thing, isn't it? Because you kind of think, well, if that happens, we wouldn't do surgery on anybody because you just say well wait, and it will go away all by itself. And that clearly doesn't happen with everybody.

David Baxter

Exactly. And that that decision is also about the risk benefit analysis. So remember, leaving somebody in pain, pain can become chronic pain can stop your working, you can start using medication which can change behaviour, it can affect your thinking, your mood, your immune system, make you constipated. So there's a cost to leaving somebody in pain. Not everyone gets better, as you say. And as our treatments become less damaging and less invasive. I think, in my mind, my algorithms, my algorithms say actually, I can just take a sequestered fragment of disc. What's causing somebody severe pain in this endoscopic way. Not when you're not when you're going into the annulus. We talked about that briefly before. But if there's already a big fragment out there that's causing very severe pain. My inclination is to offer endoscopic surgery, because it just gets you better immediately. And that's not always the case. But it's it's where I'm thinking now. And the conversations the way I counsel people have changed slightly

Steven Bruce

loose secrets, they're sequestered parts or parts of the disc. Are they always part of the annulus? Or?

David Baxter

No, usually, usually, they're part of the nucleus. So

Steven Bruce

only once has ruptured anyway.

David Baxter

So the annulus, the annulus has a tear in it. And when you're looking at the MRI scan, you I think one of your viewers mentioned it before, they talked about chemical irritation by annular tear, you can see that an MRI scan you can see there's a little bit of T2 hyperintensity in the annulus. So separate to the nucleus itself, there's a little bit of white, and that's sometimes a partly sequestered disc fragment. Sometimes it's actually a tear within the annulus and fluid within it. And that releases pro inflammatory cytokines we think that that can irritate nerves and cause pain we think. But when the annular tear is bigger, it's a physical hole. And with a disc under load, the nucleus can fragment and come out. And so when you see sequestered disc fragments, they're usually grey on T2 MRI rather than black like the annulus. And those the ones paradoxically, I think, get better the quickest, but also, they're the ones that it's least harmful to take out because they're already sequestered out.

Steven Bruce

And in terms of annular tears, you can have radial or circumferential tears. Presumably, they have their own natural course or in symptomatology. You

David Baxter

know, if they do, I don't know it. I know that. People describe back pain differently. And and there's this sort of pain that is located in the lower back and goes around the signs, which I've never really attributed to a specific structure. Certainly, I'm not sure. I'm not sure that I know there's a different there's a different symptom from radio versus

Steven Bruce

is the radio more likely to cause significant adverse consequences?

David Baxter

You know, I don't know. I don't know. Yeah,

Steven Bruce

we just think it was more like it isn't for the nucleus to leak out to a radio tower, whereas circumferential is presumably still contained.

David Baxter

UAV. Right. You may right. But I don't know. I don't know that. But

Steven Bruce

then you said anyone that you've seen a great big bulge that ought to have been causing quarter requirement, but wasn't? Is there not a sort of a natural urge to take it out anyway, because it's bound to cause a record requirement problem, adventure, really proactive about it? Well,

David Baxter

it certainly can be anxiety inducing. Given that, you know that this is this is a quote of granite can be such a damaging condition. So there's certainly you have that conversation with the patient. And very rarely, very rarely a patient's asymptomatic from those kinds of scans. With those kinds of scans. They will usually have sciatica, they might not be the full symptomatology of quarter quarter. But they've got symptoms, you could say, Well, look, this is a very, you know, it's a big disc prolapse, we could we could improve it with surgery, and it would make your leg pain better, much more difficult to say, well, you're absolutely fine. Now, I'm going to offer you an operation, you won't be any better at the end of it, but I'll be able to, I'll be able to rest the rest easier. So I think you, you counsel them, you safety net them you inform them about the what the symptoms have got to grind around. We've talked about bilateral sciatica, parallels federal and vizier instance, that you're in retention, I also throw in sexual dysfunction. And say that they need to go straight to their only

department that night, if those symptoms occur, you can also get a sense, a slightly better sense of the risk of it. And this is just, this is just me thinking some people have have constitutionally more narrow spinal canals. And there's less capacity to to tolerate a disc prolapse. And I think in those people, I have that conversation with them as well and say, Look, you know, there isn't, there isn't the space in this part of the spider's web, but more desperate to come out. It could be problematic for you. And you definitely talk about behavioural modification to try and reduce the risk of that happening.

Steven Bruce

I don't know if it's a change in medical philosophy, but, or whether it's just the sort of people that we get on this show. But when I've had spinal surgeons or other surgeons on the show in the past, there seems to be a much greater mood to telling people not to have surgery than I would have expected. Or not selling not to have surgery, but not looking for opportunities to perform it when perhaps it isn't absolutely necessary.

David Baxter

I think. I think that's a good general principle, both. Certainly, we talked about this briefly before, but in in my type of surgery, so neurosurgery. Getting to the pathology, involves trauma to the tissues, and occasionally that will then affect the biomechanics of the spine. One of the reasons I was attracted to endoscopic spinal surgery is because the amount of tissue damaged and therefore altered spinal biomechanics and pain is so much less. But it's still it's still there to an extent. So that's, I think that's one of the underlying reasons for it. I think also, it I think, that's spinal pathology is a process rather than a one off event. And so when we talked about the disc prolapse before, the disc prolapse, is a consequence of abnormal motion within that segment. The surgery doesn't fix the motion within the segment, it just stops the pressure on the nerve.

Steven Bruce

I'd like to have a look at that video that you've got an endoscopic surgery in a minute, but can we go back to the previous slide? Briefly because somebody's asked a question about the the L L five s one junction. Justin, can you put the slide back up on the screen? I think we've just moved on one. Yeah. He wants to know if there is an L five s wall if s one is lumbar. I used

David Baxter

Oh, so if there's a transitional, so No, there isn't in this case, I think it's a, it's a reasonable thing to think about if, if you see a sort of a s one to disk or bigger s one to disk, yeah.

Steven Bruce

So if, if, if there was a lumbar eyes, this one, presumably there will be no gap between oh five and s when on that CT scan.



David Baxter

Sorry, I'm struggling to keep this. So now if there's a lumbar level L1, what I think you'd see is a partial disc of L1, L2. And so it looks like there's no disc at that level. But actually, that's an L1, L2 disc or the way you count, it doesn't really matter. But essentially the last mobile, the last disc isn't actually a mobile segment. Because there's a partial fusion there in whatever way. And so most of the forces are going through the level above. So yeah, I can see why Justin, I think says that. But in this case, it wasn't that. Right.

Steven Bruce

Can we go to your video of endoscopic? Yes, yes.

David Baxter

You'll see the neck or the bat

Steven Bruce

number one would be a good way, we think that we'll have time for both of them.

Right, so this is this whopping great big hole that you were talking about earlier on? Yes.

David Baxter

So this is very similar to what it looks like, at work my screens about this size, it would be in the middle. And I could see the X ray on the top left. And so through a combination of x ray, looking through the endoscope, and this is a six millimetre scope, you can know where you are. This was the ligamentum flavum, which is the entry to the spinal canal. This is a small scissors. And what you can do is so you'll get what level you're going in here just this was our father's one, I think. And so this is the entry to the spinal canal here. So this is the last layer of the ligamentum flavum. In a moment, you should if I get it right, you should see a beautiful blush of epidural fat, which you just starting to see there.

Steven Bruce

So that really should have or dark is shown stripe at the bottom wherever you want.

David Baxter

Actually, it's golden yellow, because the light can't get in there yet. Yeah, it looks dark ish. But hopefully I'll put some scissors into that gap in a moment and make a small cut. And everything

will just become apparent. There you go. So that's epidural fat. And the reason that it's pulsating like that is because the basic, yes. The reason it's pulsating like that is because the scope has irrigation fluid running through it, which keeps the operative field clean and clear. And it also pushes some of the neural structures away. So that gives you a little bit of extra space. And so this this space here is, I think that was the interlaminar scopes as a six millimetre tube passing right into the back in the spinal canal. And I just moved forward, I edited the footage so we could move to the final final stages. So you'll see there, this was the disc ectomy so that there was a disc prolapse here that was taken out. That's an annular tear. So you can see that there's there's a chance more this could come out again in the future, but also that the hydration within the desk can leak out. And so that needs to be repaired. And my philosophy is that if possible, avoid going into the desk avoid taking the annulus. And if you can do that by decompressing superficially, that would be my preference. And people when I train other surgeons in how to do this before they've done a few cases, they always say, Well, how do I know I've done enough? How do I know I've taken them out now it's obvious because once you've done it, you can realise the optics are so good. You can see that the nervous break.

Steven Bruce

And just to confirm, we can see a relatively almost square shaped hole there. And across it there's a band of lighter tissue with what look like blood vessels for me around the outside. Is that the nerve? Yes.

David Baxter

So, to orientate, you were looking in the lumbar spine. The patient is prone to lay on their chest, and the endoscope is placed vertically through the through the skin in the back. In this situation, we're on their right hand side. So the patient's head is at this and their legs are at that end, okay, midline is here, lateral, the right hand side is here. And the edge of the for set joint is here, the spinous process, the base of the spinous processes here, they laminar if, if this is our first one than the laminar rest, one will be here, the lamina rebel five will be here, right? And that's the Transiting f1 note.

Steven Bruce

How are you being so precise? How are you guiding your incision.

David Baxter

So you use an x ray. And depending on what your target is, you, you can very precisely mark your mark a stab incision, so you'd rather protect patient in the correct position, you aim for the interlaminar window in this situation. And

Steven Bruce

I suppose it's mostly different for the cervical spine.

David Baxter

The principles are slightly different, but not not vastly, you'd you aim slightly more laterally. And again, you go for a posterior approach. What you can also do in the lumbar spine in the thoracic spine is go from the side. So you can do a transformational approach. And that allows you access to the contents of the spinal canal without going through bone, using the natural windows in the spine. And that's not possible in the in the cervical spine because of the orientation of the flat joints. And yes, and then every

Steven Bruce

some more questions for you if you wouldn't mind. Jane wants to know how quickly you would see fatty changes in the paraspinal muscles after the onset of symptoms. If indeed they do come after the onset of symptoms.

David Baxter

I'm sorry, Jane? I'm not sure I know the answer to that question. Give me a few more years of practice. Now. I'll get back to you.

Steven Bruce

Thinking about it, I would imagine that there will be a period before symptoms begin when changes have begun in the spine. So it might be very difficult to work that out. Yeah. I

David Baxter

think it is very difficult to work it out. And I'm not sure it's it's sort of causative isn't it? I'm not sure that the changes are because of the pain. I think that they they are a consequence of the I'm going to call it the motion thing or the biomechanics. That mean hyper hyper loss of muscle mass, you get this infiltration of fat? I don't know, I don't know that I know the answer to it. I think you're right, it probably precede some of the pain symptoms.

Steven Bruce

So I'm just taking these questions or other random orders, I'm not quite sure which ones follow which. But someone called Evergreen says what can be done surgically for recent onset foot drop in an elderly gent after straining his back. Mis MRI says she's me LRS, which has obviously not happened suddenly, minimal mechanical findings, majority of symptoms in lower leg MRI of lower leg reported as normal.

David Baxter

So did you say L R?

Steven Bruce

Yes.

David Baxter

Lumbar radicular. What does that stand for?

Steven Bruce

I don't know. Okay, I was really hoping you were going to get that question. So, Evergreen, you're going to tell us what you mean by LRS. It's probably going to be blindingly obvious when you tell us but at the moment, we're talking about a 60 year old patient or something like that with with foot drop.

David Baxter

So I didn't think of 60 years old. As I yeah, I didn't think of 60 as old so put drop from a neurological cause I treat urgently most of us do. So we'll try to do surgery for for complete foot drop. As soon as we can. Do you know that that on the next free list? It usually is not. When you do see foot drop, it's usually not a complete book foot drop. Usually people are subjectively weak and you might see it by getting them to do ankle raises or step ups that kind of thing. Their time is the time taken to do it they're taken to do it's more slowed. We know that if you if it's left for more than six weeks, it seldom recovers. So I'd want to investigate it and get on it relatively quickly. And then the treatment depends on the cause. If I'm sure if if Mrs. tells me what the cause is I might be able to, to sort of give you a steer. But if it's due to nerve compression within the spine, I would aim to decompress the nerve. Depends what causes it.

Steven Bruce

Right. Okay. I mean, it's quite, it's quite depressing when we see patients who come to us because it's a physical problem. I think they've got a foot drop there for a long time. And there's pretty much no solution to this. And we've had a physio in here, John Graham, who does a lot with technological rehab as much as other things and if you've come across him, but one of the things that he's got is a electronic cast with artificially fires the muscles to lift the foot in the gates cycle, which is a relatively simple process, a very simple device to attach. And

David Baxter

is that a rehab tool? Or is it no is taken were with them

Steven Bruce

is that yeah, they because they've lost the ability to lift the foot. So this thing just does it for them? Yeah. What do we got here? So I've got a red flag on here, but I can't see what the answer that question is, someone will have to tell me what that was about.

David Baxter

I haven't come across that technology before. But there's a really exciting area was certainly exciting within my practice, and which is neuromodulation in spinal conditions. And specifically, I use neuromodulation in the context of trials, to try and restore aspects of function following spinal cord injury. So possibly less relevant, but it may be interesting to your audience. with spinal cord injuries, we always tend to think of them as wanting to restore volitional movement. That's the that's the what we would assume but actually, the main things that they want to recover are bladder, bowel and sexual function. And this some exciting work going on around the world. Gregoire Courtine in Switzerland, part of the onward company with EPFL, Suzy hakama, in Louisville in Texas and David Darrow, not so not living in Texas in Louisville, and David Thoreau in Minnesota, Max Bochy in Louisville as well. And I'm sort of privileged to be able to work with the team at the London spinal cord injury centre. So that's at the Royal National Orthopaedic Hospital, when we're trying to use electrical signals to restore aspects about a malfunction, and we've done it in a few in a few people. It can work we don't know the best ways to make it work yet. And so we were start we have received funding for a tropical the Empress trial. Towards the end of last year, we're hoping to restart recruiting this summer. And what we'll do is we'll use implantable pulse generator so these are devices traditionally used in pain procedures to stimulate parts of the lumbar sacral nerve roots and also the CONUS of the spinal cord to try to improve improve blood and bowel function. So it's really exciting area Yeah, we're seeing we're seeing your motivation come in, in in the in the whole of the whole spinal health. The example that you gave with the foot drop device is one of them, but they're also peripheral nerve stimulators, vagal nerve stimulators and the spinal cord stimulator so it's really exciting area.

Steven Bruce

Yeah, it's hard to imagine how horrible it must be to have you particularly bladder and bowel bowel dysfunction as a result of something like this. We've had a few cases discussed them in our forum recently about it and it surrenders. Lateral recess to Gnosis it is fairly obvious once you think about LRS. In

David Baxter

which case, in which case, I would do a lateral recess decompression. We I think we've got a we've got a picture of that as well.

Steven Bruce

Please, if you've got you okay for me to share all your pictures with the audience afterwards.

David Baxter

Yes, I just like to double check everything. But yeah, that's how I make

Steven Bruce

sure that they're all anonymized. And it will go in as a PDF and offers a an editable file. So I'm going to remove the anonymization if you

David Baxter

if I can just double check that. So this, this is a slightly different demographic. So this was a younger patient in their 40s. And it's quite unusual to have lateral recessed nerves at that age. But it's a good example of what what I think your Jane

Steven Bruce

evergreen was. So

David Baxter

everything what you can see on this, this scan here is that there's a set hyperalgesia

Steven Bruce

tweaker.

David Baxter

You can see that there is a set and Ligament hypertrophy there, that's the black that's the black and it's squeezing the the whole speaker. So you've just got a sliver of epidural fat in the middle that sort of that's the limb of the T that's coming down and all of the nerves in the middle of bunched together there so you can really just see the CSF space. That's bilateral lateral resistance versus from hypertrophy ligamentum and set joints. I think actually this this, this is the CT scan that goes with that. So you can actually see here on the right hand picture, if I can get this out. But that ligamentum was partially calcified as well. So do you see the the smaller V in the top of that picture there, that's actually calcium within the ligamentum. And what you can do with this is what I did with this, and this one was I, again, I use the endoscope, and decompress both sides. So you can see the picture, these are the X rays, you asked me how I knew, I know where to put the instrument, use X rays to make sure that you're in the right position. This is a slightly bigger scope than six millimetres, this is an eight millimetre scope. This is the stenosis scope, you can put a bigger drill in with that. And you can see, this is the kind of thing that you can achieve. So what we're looking at here is the inside of the spinal canal at that level. The pink thing with blood vessels on the top here is the theaker for the

bag that contains the lumbar sacral nerve roots. This is the inside of the spinal canal. And the base of the spine is process, which has been drilled. So the structural integrity of the spine is still intact, but the bit that was pressing on the on the thicker has been removed. And you're able to get across to the opposite side of the spine and decompress the lateral recess on the contralateral side. So the name that you give to that is an over the top decompression because you're over the top of the spinal canal. And hopefully I included the post up picture here to show you that you can actually yeah, so this is what you can achieve. Remember the previous question before

with that calcified V Oopsy. Daisy. That's all removed there. That space is now free for the nerve roots to go through. So

not quite sure what evergreens patients pathology was. But something like that is what I would do. But anything to decompress the nerve would probably improve like, Okay.

Steven Bruce

This might be a relatively quick one. Dawn wants to know if you've come across any Arachnoiditis? Yes. Can you tell us about that.

David Baxter

So it's relatively common, your eye will see or see of perhaps 10 patients, or just under 10 patients a year roughly. You have it, it can occur, it usually occurs following some sort of intervention to the spine, whether it be usually surgery can be an injection, and patients have neuropathic leg pain, especially if it's in the lower spine. It's quite distinctive on an MRI scan, it looks like that the nerve roots are clumped together. So they've got a instead of being individual nerves running up and down the spine like this, that they're sort of, they're either clumped together, or they're stuck next to each other. So they form a line and can be very difficult to treat form of neuropathic leg pain. My advice on it is try not to get back into that position in the first place. So with the, with the surgical intervention, try not to go into the theaker. Because obviously, you've got to, you've got to go into the thing in order to cause the nerve roots to go together. And presumably it's some something like blood that's causing an irritation within the nerve roots and causing them to stick together. Once once it's happened, recognising it's important, you can't easily go back in and decompress the nerves that can cause damage. So neuropathic pain medication can be good. And I worked with some great colleagues, Dan Harloff, and taxa Fernandez and we, we use spinal cord stimulation in this context, right, okay.

Steven Bruce

Now we're running out of time. I've got a question here about another patient. Paul says he has an X nurse in her 60s with acute low back pain. You mentioned a pre op, this is an interesting one. Yeah. mentioned a previous spondylolisthesis diagnosis. He couldn't palpate any lumbar step. And I know that I think most people are agree that it's very hard to palpate a lumbar spondylolisthesis. I suspect when someone's got one and you think you palpated it then you assume you can but more often

than not they go on notice that we don't but are interested here pause experience on it. Anyway, at her second session. She brought in a tatty letter with a single sentence, stating she'd had an L five spondylolisthesis as a result of a past effect. That would have been four she would have been 14 at the time of the scan. So his question is, is it possible that that past effect and could somehow repair itself in teenagers, while the gross plates were still plastic before they reach skeletal maturity

David Baxter

It usually doesn't. And however, I see a biased sample data set. Yeah. So one of the reasons we think the past effects don't heal, they usually not symptomatic by the way, so lots of people have them and, and don't develop spondylolisthesis. But they're very difficult to repair the past. So that one, one way of thinking is to try and treat past defects before in that are causing back pain in young people before they cause a spondylolisthesis. By by fusing them together. And the way you you do that is you put a screw across the positive effect to fuse it. It can be challenging to get those to fuse. And the gap between the in the defect isn't empty, it is often full of granulation tissue or soft tissue. So actually getting a fusion across there is quite tricky, which is a reason why I don't I don't think they usually auto fuse. But to be honest, I see a ICA a bath population of people who've gone on to have usually neuropathic pain, that they're the ones that wouldn't if you've

Steven Bruce

what's your advice to a young person or to any person where you come across a scan that shows past effects? You say, well, this doesn't need repair, or it's difficult to repair? Do they have to modify their lifestyle, their activities, because there was an instability at that level?

David Baxter

So we have that conversation. And I think I'd want to understand why they had the scan done in the first place, because presumably they had symptoms that necessitated it. But if they were entirely asymptomatic from it, and we talk about the kinds of activities that make can make them worse than you typically see them in cricketers. People have done a lot of cricket growing up in in gymnasts.

Steven Bruce

People who are going to spondylosis quite possibly anyway, regardless of a positive effect.

David Baxter

Yes, yeah. Yeah, quite possibly. Yeah. Basically,

Steven Bruce

fast bowlers, I gather, though, they're quite prone and trembling, this as well as gymnastics.



David Baxter

Yeah, exactly. And so have a conversation about the kind of activities that could make it worse, the symptoms watch out for, and then the things that they can do to try and reduce the rate of thing of making things worse. And I'm a big, I'm a big believer in strengthening as in physically, physically making the paraspinal muscles and the muscles of the trunk bigger and stronger. And it's just a slight distinction that I make between the two. Because I think that that will help support the rest of the motion segment, and try and reduce the chance of others properly assessing this? And do

Steven Bruce

you have your own protocol for that I'd use a suit of the physios this is what I want you to do, and they go into it.

David Baxter

So I work with the physios who treat, treat patients. In the military, this is a great, great opportunity where we can do this because I, I went to Santos but several of them or you've got a personal relationship with them. So some of the sort of more high readiness troops that we treat, we'll have pre established protocols for them designed usually by the physiotherapist, but with my input, and it will vary depending on whether they've had a diskectomy or not entering the annulus because the risk of rupture, etc. Or fusion. Okay.

Steven Bruce

Just a couple of quick ones before we close here. Alex has said if I can ask this fine gentleman about adjacent segment disease with Fusion versus endoscopic spinal surgery, is there a difference in outcome?

David Baxter

So will your audience be familiar with adjacent segments? This is a workman Yes. Okay. So I don't I'm not sure that I'm not sure that I understand the question the same way. endoscopic spinal surgery is a range of techniques. You can do fusions within the scope, endoscope, I, I try to avoid doing fusions when I can do, but if you fuse a section of the spine, then you transfer the forces to the next mobile section of the spine and therefore get adjacent segment disease. So if you could do an endoscopic fusion, you could you'd still transfer those forces and could get adjacent segment disease there. So in that sense, in that sense, I think that you can you can get adjacent segment disease with either an open fusion or an endoscopic fusion because there's less tissue damage to the paraspinal muscles and therefore presumably, less muscle wasting that might protect the disc above but I'm not aware of any other Since in that area, what I would say is that endoscopic surgery is fantastic for treating some aspects of adjacent segment disease. So, we've had, we've had some good results in people who've got terminal stenosis or quite complex adjacent segment disease with with central canal stenosis. They've already had a fusion at the back end. And especially if you can go back transformative approach. So into essentially virgin tissue, you can do a limited decompression and not have to the alternative, which is to do an open decompression and extend the fusion. And we're

just learning how this fits into the current algorithms of Spinal Care. So it's exciting to be part of it and to learn,

Steven Bruce

it's gonna be exciting. It's gonna be fascinating. And thank you for sharing so much with us this evening. We've got no more time on really. So yeah, that's that's our 90 minutes.

DRAFT TRANSCRIPT