

Lumbar Spine Red Flags

With James Booth
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TRANSCRIPT

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Steven:

We're going to talk about red flags again today on where this time some, some different conditions. We talked about cauda equina last time. You were worried, I think earlier on that you were going to be teaching granny to suck eggs. I personally feel that we can all do with quite a bit of revision on topics like this because they are so rare aren't they?

James:

They are rare, thankfully. I guess, you know, we may only see a few of these in our practice if we're working in normal private practice, but they always stick with you when you do see the medic kind of thing that you, kind of carried through with you for the next however many years you have left in practice and beyond. So I guess what we all hope is that we get it right when we are confronted with these sorts of cases. And uhou know, as we'll see from, from the discussion, the evidence, the earlier these, these problems and detected the best of the outcomes. So important to be able to spot them.

Steven:

I suppose that we have people watching now who didn't watch our last interview on the last discussion and maybe I should just establish your credentials here because

you are an osteopath of considerable experience, not just in private osteopathic practice, but also from working in the spinal center at the Queens Medical center in Nottingham for, what was it, seven years, I think you said eight years, so working very closely with serious spinal conditions with the consultants and the physios and other practitioners there. So you know, your stuff in this regard and I guess you've probably seen quite a few of these things come through the doors.

James:

Yeah and where I worked, it was a regional center of excellence for spine care and so you do know, by the nature of the place, you see people who are at the more serious end of the spine pathology spectrum. So you see a lot more of these serious spinal conditions and I work now in a role in spinal triage working with a group of spinal surgeons and again, I'm triaging the GP referrals for them so you see more and more of these more serious pathologies presenting.

Steven:

Before we get onto the meat of this though that reminds me we were talking before we started here about you getting back to working in the NHS because you no longer work at the Queen's Medical center. How's that going?

James:

The process is fairly slow as it always is really with the NHS, nothing happens particularly quickly and I guess at the moment the focus for those who are redeploying and deploying are to get the people who are currently working in the NHS to the front line where they have the necessary and relevant skills and I suspect what's going to happen is people like myself who have previously worked in the NHS and you do have the experience to be able to help, are going to be back filling into the positions that are left vacant by those who've gone to the front line.

Steven:

Yea and do you think that's the same for everyone? You applied by a slightly different mechanism, didn't you, you applied for the return to work mechanism as opposed to going through the process that probably most chiropractors and osteopaths would go through, which is the NHS volunteers or perhaps through the Institute of osteopathy or the Royal college of Chiropractic.

James:

Yeah, they've been run slightly differently. So the body who are organizing volunteers are up and running and how they're using those volunteers for all sorts of services, mainly community based services. And whereas my return to NHS work is for people who've previously worked within the NHS and once Capita who are doing the initial screening have vetted you and made sure that you're not a risk, to employ and then being employed by the NHS your name is given to the local trusts who

would possibly require your help and it's up to them then to identify a role for you and to contact you to arrange for you to go back to work for them.

Steven:

Okay. So I guess the message for people who have applied is that if they haven't been accepted yet, then they shouldn't be deterred. It's just a slow process making sure that they are credible, legitimate, honest and upright citizens.

James:

Yeah, because I guess ultimately the Trusts who are going to be employing people who return and this is an employed position. It's not a voluntary position. They have to do the due diligence to make sure that they're covering themselves and their patients.

Steven:

Yeah. Right. So let's get on to the meat of what you wanted to talk about today. We dealt with Cauda Equine the last time and that took us quite a lengthy discussion. You've got three this time, malignancy, spinal infection and fracture. We're going to cover in 60 minutes or slightly less now.

James:

Yeah. So again, these were potential red flag conditions that were identified by the IO and GOsC as areas that we should be clear when we're doing telephone consultations that we're happy to do so in that we're able to identify these patients so that those at risk can be pushed through the system as quickly as possible. Because I think what we're all seeing at the moment in the current NHS is that people are avoiding going to the NHS because a, they don't want to risk contracting the infection, but also they don't want to feel that they are. Overwhelming the services that are already struggling. So, you know, this is almost more important at the moment because we're likely to come across people who feel that they don't want to bother the NHS. They may go to more tech type practitioners. Uhnd, and being able to identify, hhe, the conditions we are going to talk about is crucial.

Steven:

But obviously most of us, almost all of us now are not doing face to face consultations. You reckon we can successfully triage things like this over the phone or video?

James:

Yeah, absolutely. And in fact, you know, as we'll see when we go through each condition, essentially we don't need to see these patients face to face. There isn't really any examination which gives us any, information. The uthe diagnosis or the suspicion of a diagnosis is based largely around risk factors and symptoms. And, and that's all stuff that we can establish over a telephone consultation or a

telephone link. So, you know, we don't need to be seeing these patients. Basically, there's nothing that you can add by examining.

Steven:

Of the three things we're going to cover today, which should be, which of them would you say is probably the most likely to present in a clinic like ours?

James:

I think that, you know, as we'll see, they're all relatively kind of common conditions and by way of pathologies spinal pathology. So we should be alert to all of them. And, what you're not expected to do by the end of this presentation is to be able to make a diagnosis of a malignancy or a fracture or an infection, is to know that there's a potential for it and how to refer on and on what basis on which to refer on. It's not to be clear that you think somebody has got an L4 crush fracture, for example.

Steven:

And that's exactly as you were saying earlier on. That's exactly the same as we do in clinic, isn't it? Cause we can't diagnose these things in clinic without the imagery and other tests that go behind them. So. So should we start with spinal infections? Yes. So that's the first slide in your list.

James:

Well, the spinal infections are defined as an infection, which involves the vertebral body or the intervertebral disc or both, as well as the paraspinal muscle. Umt presents about between two and seven percent of a muscular skeletal infection. So MSK infections are relatively rare and spinal MSK infections are at the rare end of those, so again, this is not something we like to see a lot of and there tends to be a bi-modal allocation in the sense that people who are below the age of 20 are more at risk and then those between the age of 50 to 70 are more at risk. So you get this kind of either end of the age spectrum, resentation

Steven:

Wait, so are we taking the slide down because I'm sure people are far more keen to see your handsome little face than to look at text on the screen. But the slides will be downloadable from the recording page once we've uploaded that later on today or tomorrow.

James:

So so you've got this bi-modal allocation, the younger and the older but there's also a strong preponderance towards men being more prone to spinal infections and depending on which study, you look at the ratio of two to one to five to one in favor of men. But overall the incidence within the population is quite small between one to 20,001 and one to 100,000. However, the mortality rates can be quite high anywhere between two and 20% in the developed countries. And so although

specificity of science is pretty low, the delay in diagnosis can be catastrophic. So it's really important that if there is a suspicion of a spinal infection, that referral is made urgently.

Steven:

I was going to say that that's a mortality rate presumably relates to untreated infection rather than somebody who's diagnosed at an early stage.

James:

Well, it's either untreated or treated too late basically. So, you know, from the stats the importance of early diagnosis is what dictates a good outcome, whereas late diagnosis tends to lead to fairly poor prognosis. And the problem is that the signs and symptoms are often very subtle, so quite difficult to pick up on.

Steven:

Presumably, I mean, the NHS has got very, very hot on diagnosing sepsis recently. Does that mean that they're better at recognizing or diagnosing spinal infections as well?

James:

I wouldn't say so necessarily because the signs and symptoms are quite subtle. When back pain is probably the strongest indicator within then most of the people we see will have back pain. So that doesn't necessarily tell you anything. We would expect people to have a fever if you had an infection that, but that kind of pyrexia presentation is actually quite, quite small in terms of numbers less than half of patients will present with a fever and similarly, you know, neurological symptoms tend only to present towards the very end of this stage rather than early on so it's quite difficult to pick up on these patients and we generally wouldn't use the symptoms or the signs as the strong reason for referral. If we look up,

Steven:

Can I, can I interrupt you just for a sec because, a couple of questions are coming in and it's nice to deal with them fresh as it were. Paul Ellison's actually has just sent in a comment really that he's had three phone conversations, telephone/ telehealth consultations, which needed urgent referral and so far they all were spot on. His diagnosis was spot on and they were urgent and serious. Interesting to hear what they were if Paul has time to send that in. Mary says thank you very much for doing this. If you've got any advice around the problem of GPs, often not being able to refer our patients for MRI and what are the current NHS protocols for getting patients to have an MRI.

James:

So I can only speak for my area of Nottinghamshire we have what's called the F 12 project, which is patients have to meet certain criteria in order to warrant an MRI and

certainly if they fall into any of the risk categories that we're going to discuss in terms of malignancy, infection or fracture that would be a big tick in a box. And you know, if the GP has any suspicion that either of those or any of those pathologies is present, then they would be justified in referring for an MRI.

Steven:

So I guess the key thing then is, communication with the GP or communication to the emergency department. If that's where we've sent them, we could easily send them direct to A&E couldn't we and say, right, you're going there and take this letter or take these words with you and say you've been triaged by an osteopath or a chiropractor and we feel that there is a suspicion of infection.

James:

I certainly think, and again, we'll cover this, but I think if patients are under a cancer care team currently generally speaking, they're assigned an oncology nurse practitioner and they are a very good route back into hospital if you feel that that's required they are generally more accessible than the consultants and are more willing to get involved in re-admitting patients from the community. But all the other stuff, if a patient is not currently under the care of a hospital consultant, you know, I've always found that telephone consultations with GP's work really well. Rather than, you know, we don't have time to write letters for letters to be delivered and for GPs to read less at the moment if we think that is a serious underlying pathology, most GPs will happily have a telephone consultation with you. And, and act on any advice or recommendations that you make. So, you know, I would be bold enough if you think there's something going on, get in touch with the patient's GP and present the case and the rationale for referral to them.

Steven:

But as always, and I wouldn't want to try and teach Mary to suck eggs either but it's important to say the key words when you have that consultation isn't it, that's why you're referring not what you want them to have when they get there.

James:

Absolutely, and hopefully after today's discussion, those keywords will be more obvious to those who are making those referrals.

Steven:

Just a quick one before we move on, this is asking you to exercise your God-like powers of deduction. Angela wants to know why on earth men are more susceptible to spinal infection..do we have a weaker immune system she says.

James:

Yeah I can only suppose, I can't tell you for definite, but I would suspect that some of the risk factors that put people into those categories are risk factors for which

men are most most prevalent. So, yeah, we'll come on to them in a minute. But things like alcohol, smoking and being immuno compromised, that sort of thing is, it's probably more of a higher instance of that in men than there is in women. But interestingly, we've seen with the Covid infection at the moment, that men are more prone as well. So, you know, there may well be some underlying immunological condition or state, which means that men are more predisposed to infection than women.

Steven:

But those same risk factors could be the reason for Covid 19 as well couldn't it. Very well. Yeah. Yeah.

James:

So if we look at the patho-physiology for infection what we know is that infection can travel via the blood. So hematogenous, ufrom a distance side, uit can also spread from adjacent tissue, or it can be introduced to by a direct, uexternal source, uin adults with discitis ,the discusses most commonly travels from the end plates of the adjacent vertebra, which have been necrotised by a septic embolus. So an infection, hich travels in the blood arrives in the end plates of the vertebral body and then it, invades through the end plates into the disc to result in a discitis. Pyogenic spondylitic discitis where there is pus, in the area that tends to affect the lumbar spine more prevalently than, the thoracic spine it is quite rare in cervical spine.. So again, these are thoughts that should be going through your head. If somebody presents with neck pain, it's unlikely to be a spondolytic discitis, less so in the thoracic spine than in the lumbar spine. It is important to consider TB, particularly where we have patients who are coming from areas where TB is endemic and particularly where they're presenting with thoracic spine pain and where the symptoms tend to be a little bit more widespread because TB tends to affect two or more levels rather than as a single segment.

Steven:

You see much of an increase in TB up in Nottinghamshire?

JameS:

Not in Nottinghamshire, but we do have quite a prevalence of it in Leicestershire, which is an adjacent county to ourselves and because it doesn't have a specialist spinal service we saw a lot of the TB patients who were travelling from the Asian sub-continent arriving in Leicestershire and then developing TB subsequently,

Steven:

We interviewed a radiologist some, some time ago, a long, long time ago and he was saying that the incidents in London is increasing quite markedly, again, probably because of the different ethnicities that are congregated there.

James:

Yeah, that's right that's right. So in terms of spread from adjacent tissues, these are rare, much more so than hematogenous spread, but retro-pharyngeal abscesses is one direct route, as well as the esophageal rupture. Umm more likely, is infection from implants, surgical implants, which is something that we obviously saw, in my time in the spinal unit, and the other potential routes are spinal injections. So again, if you're discussing a back pain with a patient who's had spinal surgery within the past year or has had a spinal procedure like a nerve root block injection or a caudal epidural, facet joint block, anything like that, you know, the risk of infection should be travelling towards the forefront of your mind at that point in time.

Steven:

Couple of questions for you. Suzanne has asked if blood tests are a good way to test for spinal infection and she suggests CRP.

James:

Yeah, we'll come onto that. CRP, ESR are the two most sensitive tests and as we alluded to earlier, we are only being suspicious of infection here. It's only through imaging and laboratory testing that you can actually confirm a diagnosis.

Steven:

Yeah, that's a good reminder that we're not here to prove the diagnosis. We're just here to triage and send people through if we have got that suspicion. Elspeth asks, is it likely you could get a co-morbidity of say cancer with a spinal infection?

James:

Yeah, absolutely and I'm about to talk about risk factors and again, you know, none of what we're going to do today is going to be based around physical examination, it's all going to be based around epidemiology, risk factors and index of suspicion.

Steven:

Okay and one last one before we move on. Margaret's come back talking about referring for MRI and she says that the GPs in her area can't refer for MRI. They have to go through a physio triage. First of all, have you got any suggestions? For example, is it worth making contact with the physio triage team and saying, well look, I can do this triage and save you the problem and then I can just refer to you to refer on for MRI.

James:

It depends on the pathway. If the pathway has been set up that a patient has to go through an MSK triage process, you can't circumvent it. Unfortunately, the only way to circumvent it, is a direct attendance to an ED so unfortunately where MSK triaged services, parts of the gateway through the pathway with all always thinking terms

that we use in the NHS. But if they have to go through an MSK gateway, there's no way to get them to an MRI by saying, look, I've done it for you, so take my word for it.

Steven:

So a slightly slower process for Margaret's area.

James:

It can be any, if that is the case then you know, through a discussion with the GP, the GP can make a direct referral to the emergency department so that they can do the investigations there.

Steven:

Well, I mean this is an interesting one. Sorry I said that was the last question before we move on, Imogen said, what relevance is the trend for unpasteurized milk to the ratio of brucellosis and TB? I do like the idea that there's a disease named after me.

James:

Okay. I'm sure there's more than one. I don't know. That's, that's not something I'm familiar with the risk factors because these are, the things that we can concentrate on when we're doing our telephone consultations. As we talked about the age is an important factor, under twenties, between 50 and 70, but more so in the advanced age group. Interestingly, as with Covid, obesity' is a risk factor which should be considered and these are questions that if you're not familiar with the patients, if you haven't seen them before, and a telephone consultation is your first exposure to the patient, you should be asking things questions about BMI, as well as the use of cigarettes and alcohol drugs, substance misuse and whether they've travelled, where they are from a TB endemic country because that's relevant. Any longterm, sorry.

Steven:

No, no. Just talk to me about drugs for a second. Substance misuse, I mean, are there particular drugs, which would make them more susceptible, or is it just any old drug that they're overusing?

James:

Well, particularly intravenous drug use has massive potential for lowering people's immunity, so then you're immuno-compromised, but also has a direct route for introducing infection. So, you know, somebody may inject into their thigh and then may end up with an infection in their thigh or their groin, which can travel to the pelvis or the spine. So you know,, we see this with psoas infections, sadly, psoas abscesses, which then travel to the spine, it does trap between the psoas and the spine itself. So substance misuse is, you know, it's not a always an easy question to kind of tackle, but it's a necessary one if you suspect an infection may be an issue.

Steven:

Yeah. I was just thinking particularly over a telephone consult where you won't see any physical evidence of intravenous drug use or anything like that. It is going to be a difficult one, to get an accurate answer on because I imagine that most people doing that can be very shy of admitting to it.

James:

Yeah but I, you know, it's important, again, when we talked about this in terms of cauda equina syndrome, it's about contextualizing your questioning and giving people context so that they can understand that you're not just asking these questions because you're being nosy, but you need to be able to exclude and screen for more serious pathology. So I'm going to ask you some questions, which may seem a little bit odd, but there's a reason I'm asking is because I'm trying to screen for serious pathology, you know, have you, do you use any injected substances? Do you smoke? Do you consume alcohol? And if so, how much. You know people will understand that all you are trying to do is the best for them, you are not just prying.

Steven:

Do you have a sort of a criteria or do you have criteria of your own for deciding what is significant drinking or significant smoking? I mean, usually the answer is anything more than you do yourself, isn't it?

James:

Well, for me, any smoking is significant. So similarly with substance misuse alcohol is a difficult one because it varies depending on the gender. It also varies depending on the type of condition that you considering screening for, as you'll see with osteoporosis. For women more than three units a day increases their risk of osteoporosis, you know, that would be, for example, a figure which was bringing into my mind but if somebody said to me, I have a glass of wine every other day, I don't particularly see that as relevant but if they are drinking two bottles of White Lightening a day, then you know, potentially there is an issue.

Steven:

I wish I knew what that was, but I don't drink it. So carry on James.

James:

So a substance misuse is important to chronic infection and, again, is there anything in their medical history, particularly conditions like HIV, which would make somebody more liable or prone to chronic infection, longterm steroid use and particularly in the older age group, people who have had perhaps polymyalgia rheumatica or other inflammatory conditions where they've had long term steroid use obviously it has impacts on their immune system and therefore can put them

more risk of infection. Poor nutritional status, you know, how well do you eat? What would an average diet be like for yourself?

Steven:

Do you find, the trouble is that particularly, I didn't, I can't speak for chiropractors here, but in the osteopathic profession, particularly, if you've got a hundred osteopaths, there'll be at least 50 different ideas on what a good diet is.

James:

Yeah. But we're not talking about whether they are vegetarian or eat meat or whether they, you know, they eat processed foods or not, it's about whether they are eating regularly and whether they eat reasonable quality foods. So we don't want to get too caught up in the kind of minutiae of their diet but, you know, do you eat reasonably well? Do you eat reasonably often? So you know, poor nutritional status does put you at greater risk of infection, as does immunological incompetence. So, you know, people who have diabetes for example, are a greater risk of having immune issues, which is another factor that we're seeing in the Covid, patients. Similarly, patients with rheumatoid arthritis or other spondylo-arthropathies, IV and cancer. You know, cancer was mentioned earlier. Certainly patients who have had recently had or undergoing cancer treatments are immunocompromised.

James:

And then finally, you know, recent spine surgery or any other surgery you know, implants particularly are a source of infection and so you should be asking patients whether they've had any surgery recently, which may point in that direction. What do you, by recently? Well, I would say within the past year. You know, longer than I was expecting you to say, I must admit.. Yeah. You can harbour an infection for quite a while before it becomes symptomatic, but just because it's longer than three months, you don't want to exclude a potential infection. If somebody had spinal surgery within the past year and then developed a new onset back pain, particularly if they are feeling unwell and, have a temperature then that would be right up there in my mind, that is a suspicion.

Steven:

I just had a very useful thing sent in by John [inaudible]. He says in some situations the Royal College of Chiropractors, emergency referral form is a great way to refer patients with all the information that a further practitioner would then need rather than starting from square one or relying on patient's memory of what you've discussed. I gather he's already shared the link presumably on Facebook, but as long as he's happy and the Royal College of Chiropractors isn't sensitive to copyright or something, we'll put that up on the website as well, because you know, anything that helps us communicate with the rest of the healthcare profession is useful.

James:

. Absolutely. Absolutely.

Steven:

So (name not clear) has a question about whether self harm is also a potential source of infection.

James:

Well, I guess it depends on the extent of self-harm She was talking about cutting... So yeah, I mean, again, you know, cuts on the wrist you know, it's difficult to say no but I'm not sure. I'm not sure, if it's significant self-harm potentially, but I'm not aware that cutting the wrists is a significant factor in terms of spinal infection. Would you like a very long question? Go on.

Steven:

I don't know what the outcome of this question is cause I haven't read it yet. So it comes, from Neil Ryan who says he has a patient with sciatic symptoms he's had an MRI scan before seeing him and one of the findings was that he had bone marrow oedema at L2 and L4.. The doctor doesn't seem to have the answers to where it has come from, but prescribed painkillers. Neil's worried about infection, cancer, arthritic fracture, and on examination he seems to be experiencing facet irritation at L4/5. Along with the findings of the MRI. They discussed the issues related to the root cause of the oedema. Medical background is clear. Is there anything else you could be doing? A full scan revealed bone marrow oedema and L 5/S1 disc bulge stenosing the right neuro-foramen and contacting the L5 nerve root. That was a lot in one go. Did you manage to catch all that?

James:

Yeah, so bone marrow oedema is an interesting one because when we look at MRI scans, we get different sequences. T1/ T2 weighting and also Stir sequence and the Stir sequence is the real telling one if there's bone marrow oedema, it would show up on on the Stir sequence because there's ongoing inflammation within the bone,, whereas if it's a T2 and there's this indication of signal change in the T2 weighted, the MRI that would be more indicative of a longstanding fatty infiltration. So T1 would be short term infiltration, T1 longstanding infiltration. Uand that's more indicative of what's called moded change, which is a chronic degenerative condition rather than an infection. So it's always difficult when you haven't seen the scan to comment but I presume that the GP has done some basic bloods to rule out infection, so CRP and ESR,would do that.

Steven:

Not mentioned here I'm afraid, but let's say

James:

If he is concerned that there may be an ongoing infection, then you know, asking the GP to do some bloods wouldn't be unreasonable stating that you know, you want to rule infection out as a potential cause, but if the patient does have, doesn't have any other risk factors for infection and the MRI hasn't shown specifically that there is an infection and spondylo-discitis tends to light up pretty impressively, you don't just see like bone marrow changes, you see a fairly good ongoing infection, then you know, I think your index suspicion would be pretty low. The other thing that you could do is send the patients on for a specialist opinion,,here they could have an MRI with contrast and if the surgeon or whoever's doing the triage was concerned, they could always arrange for a biopsy , ut bone marrow oedema itself or bone marrow signal change doesn't necessarily indicate infection.

Steven:

Okay. Just remind me which is the best form of MRI to determine infection then you said Stir earlier on or was that just for bone on bone marrow oedema?

James:

So, the MRI is, the MRI, but generally speaking an MRI will be done with a T1 and a T2 ways to sequence. You can, if you think that there's a risk of infection or oedema within the bone, you can ask for a Stir sequence to be done simultaneously. S T I R yes. And that shows you get a high signal with a Stir sequence when there's inflammation.

Steven:

Right. So that's again, worth knowing some more about what constitutes surgery here. I forget who it was mentioned that someone said a lot of patients don't regard cosmetic surgery as surgery and several of us whether the dentistry counts as surgery in terms of a risk factor?

James:

I think the risks from dental surgery is more to kind of heart and head rather than spine. I'm not aware of any again, you know I'm not the expert on this, but I'm not aware of any risk of dental surgery, travelling infection from that surgery tracking to the spine and cosmetic surgery,, it depends where the cosmetic surgery has been done, but we're talking about surgery where you're either sticking needles into the spine or where you sticking scalpels around the spine, that's the more likely mode of introducing infection into the spine itself as we are focusing on, spinal infection at the moment. Okay, so shall we move on then? So if we talk about diagnosis, again, it's difficult because the symptoms tend to be fairly unspecific and insidious. The onset can be quite insidious, so back pain is probably the biggest feature as is fever paresis.

James:

And then the other more subtle finding is that pain is exacerbated on dorsal flexion. So forward bending with the head and thoracic spine maybe an indicator but it's worth bearing in mind that between 30 and 70% of patients with spondylodiscitis have no signs of infection prior to diagnosis. So, you know, don't beat yourself up if you miss it, but equally, you know, there are some subtle signs which you do well to investigate. If you think that there may be something going on that's a hell of a range. 30 to 70%. Yeah. Well this is what happens when you look at statistics. The delayed diagnosis does, as we discussed earlier, does generally mean a poor prognosis and the prognosis can be as poor as death. So, you know, it's really important if you think something is going on, rather get it wrong and err on the side of caution rather than be reluctant to refer and have somebody come to an untimely end.

Steven:

Have you got a feel for the window in this? I mean, if you diagnose somebody successfully within let's say, a month of them experiencing back pain, are they then 99% likely to come out of this well?

James:

It kind of depends on a number of factors. It depends on the patient's general state of health, how well they're able to cope with infection. It depends on the pathogen. Some pathogens will grow more rapidly and will spread more rapidly than others. It depends on which tissue has been infected. So you know, whether it's bone or disc or both and how much of surrounding tissue has been implicated. So there are a number of factors, so I think no is probably the answer to your question because without knowing any of those specifics you wouldn't be able to tell.

Steven:

We can, move on. I don't have any other questions to ask at the moment and I'm conscious we've got half an hour left and we've only done one of your topics.

James:

Okay. So as discussed earlier, diagnosis is always going to be supported by laboratory testing i.e. Bloods as well as clinical and imaging findings and in terms of blood to CRP, ESR are your most useful blood tests and MRIs are the most reliable imaging technique for detecting infection.

James:

Neil has come back and says thanks very much for what you said earlier on the patient that he was talking about that has had T1/ T2 and Stir sequences.

James:

Okay. So it's gathering information from all those different sequences would give you a little bit more of an indication as to what's going on.

James:

Keith, who says he has no knowledge of radiology what is T1/ T2 and Stir? You might want to be very quick on that one.

James:

It is a massive subject and unless you use MRIs, there's not a great deal of benefits in knowing them, but it just basically is, it's the way different tissues light up in different ways and you can use it if you working at that level where you are trying to work out what the underlying pathology is, you can use the different sequences to give you pointers in that direction, essentially. Okay. Thank you. Otherwise, we'll never get down to spinal fractures, which were about to start. So spinal fractures as is obvious results from biomechanical failure of the bone, they can be caused by underlying disease, or trauma, but it's always worth bearing in mind that sometimes underlying disease and trauma go hand in hand, so don't necessarily assume that because there has been slight trauma, and the patient has a spinal condition that there isn't necessarily an underlying disease driving the problem.

James:

The vertebral column is divided into three sections for the purposes of classifying fractures. So as that little spinal segment to your left shoulder indicates we work in terms of an anterior column, which is the kind of red area which comprises the anterior longitudinal ligament, the anterior half of the vertebral body and the disc, the middle column comprises the posterior half of the vertebral body and the disc as well as the posterior longitudinal ligament and then the posterior column that is made up of the facet joints, ligamentum flavum and the posterior elements and ligaments

Steven:

Seems odd to me to divide the spinal body into two halves.

James:

Well it is, it's all been in the sense that we don't think of the spinal segments in three sections, but when you classify it for fractures, you'll see in a minute why we do that because it becomes very important when you try to work out whether a fracture is stable or not. Okay. So we have four general types of fractures that we can classify. A, the first one is we call it a wedge fracture, which is basically a compression fracture caused by a kind of vertical loading and it impacts primarily the anterior column resulting in a wedge shaped deformity of the vertebral body, these are quite common, as you can see on that x-ray there. It can range from being a fairly slight wedge fracture something more significant where you have complete collapse of the anterior column

Steven:

I have to say that that one looks relatively subtle compared to some that I've seen. I mean, it's clearly a wedge.

James:

This is the problem with them is X rays can be often misdiagnosed or not diagnosed and I remember reading a stat, there's something like 40 to 50% of wedge fractures are not reported on by radiologists. So you know, again, it's, if you can have a look at the images yourself and be particularly aware in patients in high risk groups that there maybe a wedge fracture. Yeah. The second type of fracture that we're interested in is called a burst fracture, which again is a, a fracture of the vertebral body, but it rather than it just being crushed in the anterior column, it involves the anterior and posterior column so you get this crushing effect in all directions and one of the risks from this as you can get fragments of bone projecting posteriorly into the canal, so you get this retropulsed fragments into the spinal canal, which is obviously a significant risk factor for neurological damage.

James:

The third type of fracture we look at is what's called a dislocation fracture. And this is where one part of the column separates from another it's generally due to significant compressive, rotational attention forces. So the significance falls with twists or accidents where there's a rotational element to it and these are significant fractures and then the final type is what's called a chance fracture, sometimes referred to as seatbelt fractures because you get a forced flexion and a violent flexion over a seatbelt and that causes disruption to, both the anterior and posterior columns.

Steven:

So that child's fracture that's up there at the moment, I mean, you said it's sometimes called a seatbelt fracture. What are the mechanisms? Are there that you're aware of?

James:

Anything where there's a forced flexion over kind of an abdominal area in terms of the lumbar spine or over the chest area, the thoracic spine, it tends to be quite a violent flexion ,extension type of procedure.

Steven:

Does that happen with a modern seatbelt, which is holding the upper body stable or is that mainly lap straps?

James:

It's more lap straps that is the issue, It's important to mention that. The last three in those categories, the first fracture, the dislocation fracture, the seatbelt fracture, the mechanisms of injury are quite violent, you'd like to think that if somebody develops

either any of those fractures, that they would be attending an ED as a result of their event. It's highly unlikely that somebody has a significant enough fracture to burst the vertebral body or disrupt the anterior and posterior columns is going to walk away from that and not be examined at the scene and probably taken to hospital. So those last three categories are less likely to present you as a kind of an unknown diagnosis.

Steven:

Nonetheless, they do, don't they? I mean, when people get up with amazing damage to their various bones, but spine as well and can go for some time before it's diagnosed. So we can, we shouldn't rule them out perhaps.

James:

No, and I would say that the burst fractures are the compression fractures, the wedge fractures are the most likely to be undiagnosed and presented to you in primary care, the other two have got such a violent mechanism and patients generally have neurological impairment with them either temporarily or permanently, so you're likely for them to have in a seat at the hospital before they get to us.

Speaker 3:

[Inaudible]

James:

So in terms of the classifications, and this is why it's important when we talk about the three column divisions of the vertebral column is when we talk about stable versus unstable fractures. So stable fracture generally involves only the anterior column, so your typical wedge fracture because there isn't any disruption of the ligament, so the tissues which support the vertebral column and these fractures generally don't need a great deal of treatment that can be managed conservatively. If the anterior middle column is involved, this is an example of a burst fracture. This is more unstable but doesn't just generally necessarily mean that they would have to go to surgery unless there is a risk of a retropulsed fragment and then when all three columns are involved, as in the case of the dislocation, the chance fractures, these are unstable vertebral fractures and generally it needs stabilizing because the ligamentous integrity around the segments has been compromised and these patients won't recover spontaneously or with conservative care by and large.

James:

So because it's the most common condition that we would like to see in terms of fractures, I wanted to just focus on compression fractures. These occur as said earlier, secondary to axial compression loads needed to be by mechanical failure and now most commonly seen in patients with osteoporosis. But importantly, and this is where again, a telephone consultation is important that it's not unusual for

osteoporosis diagnosis to follow the actual fracture rather than to kind of predate and in that respect, 20% of women who've had three fractures, or rather 20% of women have had three fractures before. I should be diagnosed with osteoporosis. And that might be a wrist fracture and might be a neck of femur or it might be a vertebral fracture. So you can see from that particular step there it's not unusual for people to have a number of fractures before they get to the point of having an osteoporosis diagnosis.

Steven:

[Inaudible] Surprise me. I mean, I would have thought the first suspicion, particularly in, in a woman of anywhere around menopausal age, as soon as I got a fracture, the first thing you do is check, bone density.

James:

Not necessarily, it's unfortunate that these are often picked up when it's too late. The other thing to bear in mind is that 30% of white women between the age of 50 and 70 are osteoporotic. So, you know, osteoporosis is a significant factor in the number of women of that age. But also by the age of 80, 70% of people are osteoporotic. So it's quite a prevalent condition now.

Steven:

70% of people or women?

James:

I don't have that specific information. It was a stat. That I pulled up, about 80% of, I would say women particularly, but don't exclude men from that. Steve, I'm just going to get a charger for my iPhone. I'm terribly sorry, but it's about to run out. So,

Steven:

Okay. That's all right. I've got things like I know things I can talk about. I've been told while we're waiting for James to get his charger that, so I need to remind you about the magic of our certificates because the way this works is that we create a dummy certificate prior to these broadcasts and when you click the link to join the broadcast, you are registered as having attended and that means that the certificate will appear in your profile. I hope that made sense. Of course the certificate won't actually read anything sensible until I add in the data later in the day, after I know what we've talked about. For example, most of the stuff James is talking about here, I couldn't have predicted, so I will only get that in, I'll relate it to the chiropractic code and the osteopathic practice standards and at some stage later in the day, the text will magically update itself in the certificate.

Steven:

So all you have to do to get the certificate is to go into the website using the login details, which you should have in your profile page. There's a tag marked

certificates, iff you go there, you'll be able to claim your certificates and download them if you want to. You don't have to download them, there'll be there forever. It doesn't matter whether you remain a member of the Academy, you'll always have access to that profile. So you'll always have access to the certificates. So you can wait until the General Council actually needs them before you download them. Anyway. James appears to be back in the room.

James:

Sorry about that. So having looked at the compression fracture risk, in women with osteoporosis particularly, but generally in that age group, we can also look at compression fractures in younger people, but these tend to be more commonly associated with high energy mechanisms, so falls or fairly violent types of activities. In younger people, you would expect to see a few of them coming from rugby players. They're not common in rugby players because rugby injuries tend to be more associated with neck and upper thoracic spine, most commonly compression fractures will occur between T8 and L2. Because of the anatomical arrangements and the ligamentous arrangements in the area. Those are the most common vertebral bodies involved in compression fractures. So it's generally people who fall or land either on their bottoms or onto their feet and, the vertical compression loads tend to accumulate around the thoracolumbar junction. Okay.

Steven:

Marks asked a question or sent in an observation. Apparently he thought that fractures were more common in osteopenic patients rather than osteoporotic ones.

James:

I'm not sure that the logic would follow there other than that, perhaps osteoporotic people would be more careful, but I'm not aware that that's the case. But

Steven:

I guess either is a risk factor, which is what we are concerned with, isn't it?

James:

Absolutely right and one of the longer term complications from compression fractures, particularly in the elderly, is the risk of kyphotic deformity. So patients who kind of lose their sagittal balance because of the wedge shape of the vertebral body, and particularly if they've had two or three compression fractures, you get this kind of cumulation of wedging over a segment of area around the thoracolumbar junction and the consequences of that is that the sagittal balance is lost. The patient tends to fall forwards off the spine and then you have a more significant problem in terms of helping them to maintain centers of gravity. So in terms of compression fracture, epidemiology, 25% of women over the age of 50 years of age have had at least one vertebral compression fracture. So, you know, they're not that rare, so once somebody gets to the age of 50 and they develop back pain around the

thoracolumbar junction, particularly where there's a mechanism of injury, you should be starting to think about the potential for compression fractures.

Steven:

Well, then those ladies who ride horses need to be careful.

James:

Absolutely and this is where you see a lot of them is people falling off horses, but you can do it from reaching, you know, three feet is high enough to fall from in terms of fractures. So you know, when somebody describes having had a fall, it's always worth asking them how far they fell and where they landed and how they landed. In younger people, 50% of compression fractures generally involve motor vehicle collisions and only 25% of them come from falls so I guess that answers your question about how younger people tend to develop them. In older patients, 30% of them can occur while they're in bed and I assume by that they mean turning over in bed rather than doing anything they shouldn't be doing in bed because once you get into that high risk category, the osteoporotic risk category,

Steven:

Well what sort of things should I not be doing in bed ?

James:

Dave. I know you too well to start going there, but with this age group, coughing, sneezing, mobilizing from one chair to another or in and out of the bath that can be enough and very often, you know, I see patients in that older age group who are osteoporotic, who have done something like bend over to lift a plant pot and you know, wedge fracture results. So, you know, don't make any assumptions about there not being enough of a mechanism for it in that particular group.

James:

And then finally to look at kind of differentials, for this particular condition. Multiple myeloma is an important one, metastatic deposits or infection. Hopefully after today you feel competent enough to screen for any of those things, but also remember they are high energy fractures, as we discussed earlier, will often be associated with other injuries, so sometimes a patient will go to the hospital with an injury somewhere else in their body that has occurred as a result of the high energy condition and the vertebral fracture gets missed because they don't necessarily present with that as their primary condition.

James:

So the risk factors for compression fracture, females more than men probably because of the osteoporosis issue over the age of 65 people who have malabsorption syndrome, so inflammatory bowel disease, Celiac's disease, that kind of thing are more at risk of impaired bone density endocrine issues such as

hyperparathyroidism, steroid use. Again particularly patients who are slightly older who've been diagnosed with polymyalgia rheumatica and you end up on steroids for four, five, six years, they, you know, become much higher risk, alcohol, smoking and a history of tumor malignancy. Don't forget the risk of a pathological fracture rather than osteoporotic fracture. So again, you don't need to physically examine any of your patients if they fall into the high risk categories. If they have some risk factors and they have subtle signs of presentation, particularly around the thoracolumbar junction between (inaudible) and L2, you should be considering fractures as a possible concern.

James:

[Inaudible]

Steven:

Couple of observations for you Olwen said she thought that osteopenia was simply a radiographic appearance of a diagnosis of osteoporosis. I thought that it was actually a category, slightly less bone.

James:

So you have normal bone density, which is a range, then you have osteopenic range and then an osteoporotic range.

James:

Christina has said, Alendronic acid and bi-phosphonates render more fractures after four years of use, it may be good to find out if and how long a patient has been using those. Is that something that's crossed your radar?

James:

Yeah, I mean osteoporosis is a massive issue, and you know, the medications are somewhat controversial but again, kind of slightly beyond the scope of what we are doing today. So you know, we can come back and discuss those two processes in more detail if that's required.

Steven:

Yeah. And someone else is coming with a similar observation about them and says that a DEXA scan would be the best way of confirming osteoporosis. Actually, I suspect that there's a better way now than DEXA as well, which we're hoping to get covered on one of these shows in the near future.

James:

DEXA is used around here and using hip and lumbar spine DEXA scans is around your area is, the method of choice.

Steven:

Josephine wants to know about your view on kyphoplasty for managing wedge fractures.

James:

There was a big craze of doing it. Maybe between 10 and five years ago almost everybody who had a wedge fracture was getting Carter plastid or was being cemented, cement augmented but that's kind of the evidence for that is slightly, we can do over the last three or four years and there are risks associated with it. You know, it's not a risk free-procedure. You have to stick Jamshidi needles into vertebral bodies and you have to pump cement into the vertebral body, which means displacing marrow and if you inject more than 20 mls into one patient, you can displace sufficient marrow to cause a marrow embolism, which can kill your patient. The other risk of course, if somebody has osteoporosis you cram one segment full of rock hard cement, your soft segments, either side of it tend to collapse over the rock-hard vertebral segments, there are a lot of things that have to be considered before you do cement augmentation or Rexburg plasty and I think because of that, the trend for doing it, is weakening compared to how it was five or 10 years ago.

Steven:

I remember we talked to spinal consultant, Nick Birch about those sorts of procedures and I think you said that the stuff they use to rebuild the spinal bodies is called muda. She said was wittingly translated by many orthopods as mashed up dead Americans because it's actually, it's a mixture of cement and other people's bone he told us. Yeah.

James:

Yeah it's incredibly hard and so what you sometimes see where patients who've had a cement augmentation is that say the T12 will be cemented and then three, four months later T11 has collapsed over the top of it because it's so soft. So you know it's an option for patients who are in a lot of pain or who are struggling to mobilize after a fracture so that it can be used to in patients who are hospitalized because of pain or immobility. Otherwise you would tend not to kind of rush towards cement augmentation or vertebral plasty.. Okay.

Steven:

Amanda's asked a question about motor vehicle accidents, which you talked about earlier on. Do you normally find that the fractures occur in a certain range and I think you said it was T8 to L2.

James:

Yeah, those are the most common areas for the fractures and that's because of the anatomical arrangements and the ligamentous structures that are supporting the spine in that area.

Steven:

Sonya sent in, that she's had a couple with pain at approximately L4, but a new fracture showed in the upper lumbers or the T/L area.

James:

So again, I guess what you have to do is determine whether the fracture that's been identified on imaging is new or old fracture and that's where your Stir sequence can come in because your Stir will show up active inflammation within the bone, which tends to suggest a more recent fracture, you often pick up old fractures that the patient never knew they had.

Steven:

Who decides whether to carry out a Stir sequence there? I mean,, does the radiographer decide that's what's appropriate for what you've asked him to do to identify or do you have to specify I need a Stir sequence for whatever.

James:

I always specify it because I don't want to leave that to chance. Some radiologists will, request a Stir sequence if the question you're asking is potential fracture or potential infection. So sometimes they will use their judgment based on the clinical reason for referral, but I tend not to leave that to chance, I'll specify what sequences that I wanted if I think that's something we need.

Steven:

So, if we get a GP to make that referral, does that referral go to a radiologist? Cause I assumed it went to the radiography department first of all and they just did what the GP said because the radiologist specified before they get to see the patient.

James:

Well, all referrals are vetted to make sure that they are suitable for imaging and that they meet all the clinical criteria, so everything is seen before it's done basically. Right.

Steven:

Sorry I distracted you and we've only got five minutes left.

James:

That's fine. So a compression fractures generally recover reasonably well, tend to take about six weeks, but can leave the patient with more chronic aid, but they can also last for several months, even after the bone is healed and the Stir sequence can show that there's no active inflammation and patients are generally managed conservatively. They sometimes need a brace like a TLSO brace to help stabilize but generally pain medication [inaudible] and where appropriate osteoporosis

medication is necessary. We've touched on the vertebroplasty and kyphoplasty but generally speaking, young patients with unstable fractures will have surgery but otherwise if it's stable fracture with the surgeons, tend to want to leave them alone.

James:

Neil sent in something about plasma injections., Is that something you're familiar with? I've never heard of them. No. Uhe says,it's an interesting form of new treatment, plasma injections at the site of the fracture.

James:

No, I'm not sure the NHS yet. So let's move on to spinal metastasis because this is, you know, another important area and we will have to kind of whistle stop it slightly. But bone is the third most common sites of metastasis after the liver and lung,so, you know, it should be out there, particularly in patients who have had a previous cancer,uthe most common primary cancers to metastasize to the spine are the breast, the lung, the prostate, the thyroid and the kidneys. So when you're discussing with a patient their medical history, if they've had cancer in any of those five organs,you need to be thinking seriously about the possible for metastatic deposits because 30% of these patients will develop metastasis.

James:

. So 30% of these patients will develop metastasis. So, you know, there's a high risk in patients who've had cancer in one of those primaries. A metastatic spinal cord compression is a rare complication of spinal Mets between three and 5% of patients will go on to develop metastatic cord compression and in a lot of these patients, 20% of them, the neurological symptoms are the first sign of malignancies. So, you know, rather scary for us working in primary care,that's something that we sometimes have to deal with. The spread from the primary is generally by the arterial roots,of the vertebra, the venous plexus, or by direct invasion, so it can infiltrate, from surrounding tissue, but the most important thing to remember here is a lack of a history of cancer doesn't necessarily mean there is no risk of spinal metastasis. Very often patients are diagnosed with their primary cancer after the metastasis have been discovered, particularly in conditions like prostate cancer. Unfortunately, men tend to make assumptions about,the change in urinary habits over the years and just put it down to old age and it's only when they develop a compression fracture from a pathological fracture that they are diagnosed with primary prostate cancer.

James:

The symptoms again, are really difficult, but the biggest one I guess is increasing back pain, but it's pain that has new features to it. It feels different. It's more severe. These patients are really quite distressed by their pain. They're not coming in and grumbling and saying this doesn't feel very nice. They have a real sense of distress about their pain and it's a difficult thing to really express until you've seen it. But if

you've seen a patient with metastatic bone deposits they generally are quite distressed about their pain, it is unrelenting, it really disturbs their sleep and they become very, very anxious about it and often because they know they have a history of cancer and that this is a risk for them. Metastatic spine cancer can be localized, but it can also be fairly generalized depending on what structures have become involved.

James:

And very often in the thoracic spine, the pain tends to radiate around the chest, like a band, and you get kind of multilevel involvement with it. So it's not, it doesn't just focus on one, dermatological one segment. It tends to be kind of a radiating pain around the chest. Very often with these patients they'll describe pain as worse when they lie down and as a result their sleep is very disturbed. Um guess one of the more scary aspects of this is that the symptoms can wax and wane. So, you know, I remember when I was training and people would often say, well, you know, their symptoms come and go, so it can't be anything serious because you know, bone cancer doesn't come and go again. It's always there. Well, you know, the reality is the symptoms in these metastatic deposits can wax and wane so don't be reassured by the fact that the patient presents with that particular feature. The symptoms are often exacerbated by coughing and sneezing and towards the end stages they may present with radicular symptoms and again, worrying that that might be the first presentation, s the neurological symptoms. The strongest indicator of metastatic deposits though is that somebody has previously had a cancer, a primary cancer in one of those tissues that we described earlier.

Steven:

When you're talking about sensory motor deficit, what are the other particular tests which are likely to come up positive then.

James:

Just your standard neurological testing because it's sensory compromised is the most common one so pins and needles numbness, ut they can also have a weakness. They can develop, changes in their reflexes, so you know, if somebody has any of those symptoms and they have a history of cancer and you know, just don't hesitate, refer them on, you know, send them to the GP if they're no longer under the care of the hospital and be very clear about what your concerns are. Don't beat around the bush and GP's like us, don't want to miss these things so they are much more likely to refer somebody on if you have raised the potential that you think there is secondary deposits.

James:

If the patient is still under the care of a cancer team in the hospital, as I say, get in touch with the oncology nurse because they will generally help to expedite an inward referral. Mris are the gold standard, again, in terms of diagnosis, X rays

commonly used you'll often see GP's will do an X- Ray to exclude metastatic deposits, but the test is poor and it only really reveals deposits when they are quite an advanced stage. The kind of the early, more subtle ones are not generally picked up by X-Ray and then CT is often used by the surgeons when they're doing a preoperative planning care for these patients is generally a, an MDT approach, which we involve surgeons, oncologists, radiologists it is well beyond our scope of practice, because these patients are not looking to get better, basically you're looking to preserve function and help them maintain a quality of life. So that was kind of fairly whistle stop tour ish through metastatic deposit.

Steven:

Yeah, I got blamed for that. Apparently people were saying that we need to get you back because you were being interrupted by me too often. I like to think I was interrupting you with not just my own questions but some sensible ones from other people as well. But I hope that it added to the quality of the discussion, but it'd be great to get you back in with more of this stuff, James, because you are clearly very knowledgeable. Sorry, your conclusions though, what should we draw from your topic today?

James:

You know, I think the important thing to remember is serious spine pathology is rare, which is not say doesn't happen because clearly it does , but we shouldn't be thinking about it unless we have concerns that the patients fall into the risk categories or they present with features which are indicative of serious pathology. You know, we shouldn't turn every patient who comes in with thoracic pain into potential pathology and similarly, you know, if somebody does fits any of those criteria or there is an invested suspicion act on it, don't dither because early identification and referral is crucial for good outcomes. And one of the things that I always find is that if I have a niggling suspicion that something's going on, you know I , may treat once or twice and if the patient's not getting better or if in fact they are getting worse, then I don't hesitate at that point I send them on.

James:

Because you would expect things that are not serious to get better with some treatment. Clinical reasoning and context is so crucial when you try to identify pathology. So it's really important that you apply the stuff that we've talked about today and the context in which patients present and try and rationalize your thoughts, but within all of that, you know, we have to accept that it's a very uncertain area. We don't have the technology. We as clinicians can't just image people. We can't do blood tests. So we have to accept that there is a degree of uncertainty with our patients when we think there may be something going on and there's nothing wrong with that, and if you have some uncertainty, ask for some help and good communication with GP's. You know, it goes a long way and they would much rather you made that referral than didn't.

Steven:

If I can finish with just a couple of quick questions James, because I realized we are a little bit over time. I don't think the viewers will mind that. Are you okay just to give us a few more moments Augusta says, is the radiation around the ribs that you talked about bilateral or unilateral.

James:

It depends where the deposit is. So I wouldn't consider unilateral is as an exclusion , but equally I wouldn't expect that you would have to see bilateral, you know, it just depends. It depends how big the deposit is within the vertebrae. It depends where it is in the vertebra, don't make any assumptions but a radiating pain going around the ribs and it has the other features like, you know, worse on lying down, worse with coughing, sneezing unremitting pain, different pain that normally you have causing a degree of anxiety and with a history of any of those primaries, you know, refer them on.

Steven:

Wendy's asked about other diagnostic tools, particularly for patients who are claustrophobic and won't have an MRI.

James:

So the options for patients who are claustrophobic is that you can use diazepam to help them to settle before they go into the scanner if they are really claustrophobic and can't cope with that, you can have an MRI done under sedation or even a GA, if it's that desperate. Some places do have access to wide bore scanners, so scanners that have got a wider aperture, which makes it easier for people to cope with or even open scanners there are a limited number of open scanners around which can be used, but they are few and far between currently in the NHS. Anyway, so you know, don't allow claustrophobia to be the thing that dissuades somebody. If you really think they have a serious pathology, there are ways of getting them into an MRI machine.

Steven:

Yeah. Helen's asked how prevalent you think a psoas abscess might be in our field of work and what would you say are the key indicators?

James:

So I don't have any figures specifically on how prevalent they are, but if somebody is presenting with pain, in their lower abdomen and into their spine, if they have a temperature and are generally feeling unwell, I would have blood tests done sooner rather than later. I wouldn't treat them. If they don't have the temperature and they don't have the general feeling of malaise and unwellness, then you know, if you palpate they have real tenderness around there and they are in one of the high risk categories, I would send them on. Again, it's, you know, as I've just said, use your

clinical reasoning, apply context to the case. If somebody falls into a risk category for infection and they have tenderness around their psoas muscle when you palpate them and their decent symptoms to suggest there's something going on, have a blood test done, you're not going to lose anything by having an ESR CRP done. Uand if it delays treatment by a week, then so be it. Okay.

Steven:

Final one. Ian Stewart says, how common is small cell carcinoma related to smoking? How commonly is it related to smoking?

James:

You know, the different types of, I'm not an expert on oncology, so I'm not going to pretend that I am. There are different types of lung cancer and you know, unfortunately I don't have the stats on specifically, which histological types of lung cancer presented the spine more commonly. But if somebody had a history of smoking and they present with bony type pain in the spine, you know, your index of suspicion goes up. So, hf they've had a history of lung cancer, then your indices suspicion is going through the roof. So I would definitely, wouldn't worry too much on the histology. The other thing that's kind of within our scope of practice, mf somebody has got a history of lung cancer, you refer them on and if they have features which predispose them to lung cancer and they have spinal pain, it's worth getting investigated.

Steven:

Okay. Brilliant. James, thanks very much. Thanks for allowing us to run on a little bit extra there I feel that you might be in demand and we should get you back in again in the future. I know, there's an awful lot that you've experienced as part of the Queens Medical Center and elsewhere, which would be a huge interest to the osteopaths, chiropractors, physios who are watching. But thank you for today.