CASE REPORT

Persistent back pain in the absence of clear red flags

Christopher C Ledford,^{1,2} Colin Linthicum²

¹Department of Family Medicine, UNC Chapel Hill, Chapel Hill, North Carolina, USA

²Department of Family Medicine, Ft Belvoir Community Hospital, Fort Belvoir, Virginia, USA

Correspondence to
Dr Christopher C Ledford,
chrisledford97@gmail.com

SUMMARY

A 62-year-old woman with low back pain was eventually diagnosed with vertebral osteomyelitis after multiple visits to emergency, primary and specialty care. The absence of traditional 'red flags' from her history and examination serves as an important reminder that their absence does not necessarily reflect benign pathology.

BACKGROUND

Acute back pain is a common presenting symptom in primary care settings.¹ It is estimated that approximately 50% of adults have experienced back pain in the past 12 months and two-thirds of adults experience back pain at some point in their lifetime.² While most back pain is due to benign causes such as muscle strain, it occasionally signals a significant pathology.^{3 4} This case is presented because stereotypical 'red flags' of back pain were subtle and likely delayed a definitive diagnosis. We

offer this case report as a reminder of a less common cause of back pain, and as a reminder of the importance of close follow-up and iterative testing until an aetiology is identified.

CASE PRESENTATION

A 62-year-old previously healthy woman, presented to the emergency department with lower back pain. Her history on this visit to the emergency department did not reveal any traumatic cause of the back pain. Her examination did not reveal any neurological deficits, and only demonstrated pain with range of motion testing. She was diagnosed with a lumbar strain and was given analgesics. Three days later she returned to the emergency department with persistent back pain, new onset of hip pain and a reported self-measured temperature of 103°F. Pelvic plain films were unremarkable; she had an elevated erythrocyte sedimentation rate (ESR) of 105 mm/h and a normal white cell count.

Figure 1 Sagittal CT demonstrating L5-S1 discitis/osteomyelitis with superior S1 osteolysis and a pre sacral rim enhancing fluid collection 8.8 cm long.

To cite: Ledford CC, Linthicum C. *BMJ Case Rep* Published online: [please include Day Month Year] doi:10.1136/bcr-2013-010069

She was diagnosed with polymyalgia rheumatica (PMR) and started on low-dose oral systemic steroids. In a follow-up appointment 1 week later, she reported slight improvement in her pain but still felt fatigued. During the course of these evaluations, the patient began to experience some constipation, for which she began taking polyethylene glycol. With the lack of improvement in her symptoms and because of persistent elevation in inflammatory markers (ESR essentially unchanged at 99 mm/h and C reactive protein (CRP) 8 mg/dL), the systemic steroids were continued. Additionally, because of unclear aetiology, rheumatology was consulted and recommended additional labs and outpatient rheumatology follow-up was arranged at that time. In primary care follow-up 10 days later her symptoms of fatigue and dull right-sided lower back pain and right hip pain persisted. After evaluation by rheumatology that same day, the systemic steroids were tapered off because of the rationale that PMR would have responded by this point. MRI of the lumbar spine was ordered by the rheumatologist as part of further outpatient work-up, this imaging modality was chosen because of the concern for an infectious process given the higher sensitivities than other modalities.^{5 6} Three days later, prior to MRI being completed, the patient again sought emergency care when her back pain became more severe. In the course of her emergency department work-up, a CT scan revealed L5–S1 discitis/osteomyelitis with superior S1 endplate osteolysis, slight widening of the L5–S1 intervertebral disc space

and a presacral rim enhancing fluid collection measuring 8.8 cm, spanning from the level of the mid-L5 vertebral body to the level of S3 vertebral body in figure 1 and a 6.1×4.2 cm rim-enhancing fluid collection in transverse view in figure 2. Although MRI is the imaging modality with higher sensitivity than CT, the expediency and availability of CT may over-ride the preferences for higher sensitivity when attempting to make an emergent diagnosis.

The patient was transferred to a medical centre with interventional radiology capability and the abscess was drained (indwelling catheter placed). She was treated with intravenous ciprofloxacin, vancomycin and metronidazole. During her hospital course she had a normal echocardiogram. The drained fluid cultures were found to grow fusobacteria, and intravenous antibiotics were switched to ertapenem. The patient was discharged 9 days later on a course of intravenous ertapenem for a planned 6-week course. The indwelling drain was removed 4 days after discharge from the hospital.

In outpatient follow-up she was found to have persistent pain and a residual abscess. Approximately 3 weeks later she had worsening back pain similar to the pain at original presentation, and she remained afebrile. A repeat CT scan revealed a persistent fluid collection, smaller than admission but still persisting from her last CT and not amenable to drainage. Her antibiotics were broadened to vancomycin and meropenem by infectious disease consultants, based on her slightly worsened clinical

Figure 2 Transverse CT demonstrating 6.1×4.2 cm rim enhancing fluid collection.

condition. Subsequently her back pain improved, and her white cell count decreased to $5.0 \times 10(3)/\mu\text{L}$ (normal differential). The ESR was stable at 100 mm/h and her CRP decreased to 3.5 mg/dL. Blood cultures were negative. Repeat imaging demonstrated no reaccumulation of fluid at the conclusion of the additional 6 weeks of intravenous antibiotic therapy.

DIFFERENTIAL DIAGNOSIS

The leading differential diagnoses in this case were paraspinal muscle strain/sprain, lumbar degenerative joint disease, polymyalgia rheumatica and systemic lupus erythematosus.

However, when symptoms worsened in the setting of empiric treatment for muscular aetiology and PMR, the differential diagnosis list was broadened. Without a personal history of cancer, and with no pre-disposing risk factors for low bone density, fracture remained lower on the differential. Though rare, infectious aetiology should be included in the differential diagnosis when inflammatory and infectious markers are elevated.

TREATMENT

Initial therapy consisted of analgesics (acetaminophen, non-steroidal anti-inflammatory drugs, oxycodone/acetaminophen), skeletal muscle relaxants (cyclobenzaprine), home physical therapy exercises, then trial of systemic steroids (prednisone) and referral to a rheumatology specialist. The definitive treatment included CT-guided percutaneous drainage of the presacral abscess and intravenous antibiotics, vancomycin and meropenem, for 6 weeks.

OUTCOME AND FOLLOW-UP

Nearly 4 months following the initial presentation to emergency care the patient had a colonoscopy to evaluate for any evidence of inflammatory bowel disease or a fistula that could have created the presacral abscess. Because no clear aetiology of this abscess had been determined, it was decided between consultation of infectious disease consultants and gastroenterologists that investigating for a potential fistula or evidence of inflammatory bowel disease would be warranted to try to elucidate the aetiology of this abscess and infection. The colonoscopy was normal without any evidence of inflammatory bowel disease or fistula formation. The colonoscopy was not viewed as a mandatory aspect of the work-up but chosen only after other investigations did not reveal a clear aetiology. Beyond this the patient had some mild low-back pain and continues to engage in home physical therapy exercises.

DISCUSSION

Abscess or infection continues to be a rare (<1%) cause of acute back pain in the primary care setting.³ Several case reports continue to highlight the importance of diligent pursuit of an aetiology in cases of acute back pain that do not improve or resolve. Ramos *et al*⁷ presented a recent case of fusobacterium species as the causal agent in vertebral osteomyelitis. They note this as a rare causative organism. Their case was particularly remarkable because the affected patient had back pain for 3 months and a medical history remarkable for Crohn's disease. Additionally, other recent cases highlight the importance of considering infectious aetiology in back pain without other specific aetiologies.^{8–15} In our patient's case, we were falsely reassured by the paucity of fever (only two brief fevers noted in this patient's history) and her overall good health. Many authors and committees have developed lists of 'red flags',^{1 4 16–18} and

though there is no standardised list or absolute concurrence among authors (box 1), testing paradigms are generally evaluating for fracture, infection, malignancy and cauda equina syndrome. Careful consideration of all possible concerning symptoms and signs whether they have been labelled 'red flags' or not in the literature are important. This case reiterates the importance of pursuing a definitive aetiology when initial diagnostic suspicions are essentially ruled out. Despite the current trends in medicine to appropriately limit unnecessary imaging, especially in low back pain,¹⁹ this patient's back pain aetiology required the use of advanced imaging to identify the cause. Earlier use of lumbar spine plain films when initial investigations did not reveal an aetiology but symptoms continued to worsen would have been appropriate in this case. *The American College of Radiology* appropriateness criteria supports the use of plain films when red flags are present, including unexplained fever.¹⁶ We do not advocate for indiscriminate use of advanced imaging in the work-up of low-back pain, but advocate judicious use when symptoms or signs indicate progression of the disease process.

Additionally, 'red flags' may take subtle routes of presentation, in this case the isolated fever along with this patient's general description of continuing to feel fatigued (an alternate presentation of being systemically unwell). In this case, the isolated fever 'red flag' was minimised because it was not persistent. We were inappropriately reassured by the lack of red flags related to neurological, malignant or fracture aetiologies. Thus we incorrectly discounted the isolated fever as a potential prompt towards an infectious aetiology. Despite the course of this case taking less than 6 weeks to diagnose, the clinical course, including repetitive visits for the same symptoms, should have served as a 'red flag' prompting a more aggressive investigation.

Box 1 Red flags to screen for fracture, undiagnosed/metastatic cancer, infection, cauda equina etiologies

Personal history of cancer^{1 4 14–16}
 Unexplained weight loss,^{1 4 14 16} insidious onset^{4 14 15}
 Pain increased or unrelieved by rest^{1 4 15} or progressively worsening^{1 4 16}
 Bladder or bowel incontinence, urinary retention, progressive motor or sensory loss, cauda equina syndrome^{1 4 14–16}
 Significant trauma related to age (major trauma in young, minor in elderly)⁴
 Prolonged corticosteroid use^{1 4 14–16}
 Severe pain and lumbar spine surgery in the past year¹
 Intravenous drug use,^{1 4 14 16} immunosuppression^{1 4 14–16} (HIV, diabetes mellitus, etc), severe pain, distant lumbar spine surgery^{1 14}
 Age >70^{1 4 14}
 Sensory level alteration from trunk down
 Trauma, cumulative trauma, violent trauma^{14–16}
 Age >50, especially women and males with osteoporosis or compression fracture¹⁴
 Fever,^{14–16} history of urinary or other infection^{4 14 15}
 Duration longer than 6 weeks¹⁴
 Age of onset <20 years or >55 years^{4 16}
 Thoracic pain¹⁶
 Systemically unwell^{4 16}
 Clinician diagnosis of fracture⁴

Learning points

- ▶ Red flags are not always prominent, and subtle red flag symptoms or signs should prompt further clinical investigation when initial treatment courses do not improve symptoms as anticipated.
- ▶ Basic (X-ray) and advanced (CT or MRI) should be considered early (even prior to a formal 6 week point) in evaluation of unremitting back pain, even if prominent red flag symptoms are absent but other markers of infection or inflammation persist.
- ▶ A high index of clinical suspicion is essential when seeking a relatively rare aetiology of back pain, such as infection.

Acknowledgements The authors thank Anthony Viera, MD, MPH, for his feedback and edits on drafts of this manuscript.

Disclaimer The views expressed in this article are those of the authors and do not necessarily reflect the official policy or position of the Department of the Army, Department of the Air Force nor the US Government.

Competing interests None.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

REFERENCES

- 1 Casazza BA. Diagnosis and treatment of acute low back pain. *Am Fam Physician* 2012;85:343–50.
- 2 Deyo RA, Mirza SK, Martin BI. Back pain prevalence and visit rates: estimates from US National Surveys, 2002. *Spine* 2006;31:2724–7.
- 3 Duffy RL. Low back pain: an approach to diagnosis and management. *Prim Care* 2010;37:729–41. vi.
- 4 Henschke N, Maher CG, Refshauge KM, *et al.* Prevalence of and screening for serious spinal pathology in patients presenting to primary care settings with acute low back pain. *Arthritis Rheum* 2009;60:3072–80.
- 5 Jevtic V. Vertebral infection. *Eur Radiol* 2004;14(Suppl 3):E43–52.
- 6 Sammak B, Abd El Bagi M, Al Shahed M, *et al.* Osteomyelitis: a review of currently used imaging techniques. *Eur Radiol* 1999;9:894–900.
- 7 Ramos A, Berbari E, Huddleston P. Diagnosis and treatment of Fusobacterium nucleatum discitis and vertebral osteomyelitis—Case report and review of the literature. *Spine* 2013;38:E120–2.
- 8 Crowest PRO, Hughes PJ, Elkins A, *et al.* A rare presentation of spinal epidural abscess. *BMJ Case Rep* 2011;2011:pii:bcr0820114647.
- 9 O'Keeffe AB, Terris J, Hormbrey P. A sinister cause of back pain in a young man. *BMJ* 2012;344:e3015.
- 10 Wangjirapan A, Kongthavonsakul K, Oberdorfer P. An 8-year-old boy with severe disseminated *Staphylococcus aureus* infection. *BMJ Case Rep* 2012;2012:pii:bcr2012007398.
- 11 Villaverde H, Gotuzzo E, Seas C. Chronic, progressive back pain, fever and a noticeable paravertebral mass. *Am J Trop Med Hyg* 2011;84:363.
- 12 Shields DW, Robinson PG. Iliopsoas abscess masquerading as “sciatica”. *BMJ Case Rep* 2012;2012:pii:bcr2012007419.
- 13 Bernard F, Rossi P, Lagier JC, *et al.* Lumbar septic arthritis and psoas abscess due to *Aggregatibacter aphrophilus*. *BMJ Case Rep* 2011;2011:pii:bcr0820103215.
- 14 Harries LW, Watura R. Septic arthritis of unilateral lumbar facet joint with contiguous abscess, without prior intervention. *BMJ Case Rep* 2012;2012:pii:bcr0920114849.
- 15 Dickson JM, Warren DJ, Chapman ALN, *et al.* Spontaneous abscess of the lumbar spine presenting as subacute back pain. *BMJ Case Rep* 2010;2010:pii:bcr1120092505.
- 16 Davis P, Wippold F, Cornelius R, *et al.* American College of Radiology appropriateness criteria, low back pain. American College of Radiology, 2011.
- 17 Goertz M, Thorson D, Bonsell J, *et al.* Adult acute and subacute low back pain [Internet]. Institute for Clinical Systems Improvement, 2012. [cited 28 Dec 2012]. <http://www.icsi.or0067>
- 18 Van Tulder M, Becker A, Bekkering T, *et al.* Chapter 3. European guidelines for the management of acute nonspecific low back pain in primary care. *Eur Spine J* 2006;15(Suppl 2):S169–91.
- 19 Srinivas SV, Deyo RA, Berger ZD. Application of “less is more” to low back pain. *Arch Intern Med* 2012;172:1016–20.

Copyright 2013 BMJ Publishing Group. All rights reserved. For permission to reuse any of this content visit <http://group.bmj.com/group/rights-licensing/permissions>.
BMJ Case Report Fellows may re-use this article for personal use and teaching without any further permission.

Become a Fellow of BMJ Case Reports today and you can:

- ▶ Submit as many cases as you like
- ▶ Enjoy fast sympathetic peer review and rapid publication of accepted articles
- ▶ Access all the published articles
- ▶ Re-use any of the published material for personal use and teaching without further permission

For information on Institutional Fellowships contact consortiasales@bmjgroup.com

Visit casereports.bmj.com for more articles like this and to become a Fellow