

# COMPLICATIONS OF ACUPUNCTURE TREATMENT: IS SEPTIC ARTHRITIS OF LUMBAR FACET JOINT POSSIBLE?

Tan Jun Hao, Dr Gabriel Liu, Dr Gurpal Singh

## ABSTRACT

Acupuncture has become a popular alternative modality in the treatment of back pain. However, few have reported complications related to this treatment modality.

This study reports a rare case of septic arthritis of the lumbar facet joints, developing after acupuncture, and its devastating effects upon the patient.

A 68-year-old female developed septic arthritis of the lumbar facet joints after acupuncture for symptomatic control of lumbar spondylosis and stenosis while waiting for surgery. Subsequently, successful control of the infection required a total of 4 hospital admissions over a 2-year period, a CT guided spinal biopsy and 6 months of antibiotics.

## Keywords:

Lumbar facet joint, Septic arthritis, Acupuncture

SFP2014; 40(1): 74-77

## PATIENT'S REVELATION: WHAT HAPPENED?

A 68-year-old housewife presented to the spine clinic with 3 months history of lower back pain and bilateral L5 neurogenic claudication. Clinical examination was unremarkable. X-rays showed L5/S1 grade I spondylolisthesis and L4/L5 degenerative disc disease (Figure 1). MRI confirmed L5/S1 spinal stenosis (Figure 2). She was treated conservatively with analgesia, physiotherapy and acupuncture at a tertiary hospital.

The patient underwent two sessions of acupuncture therapy in the tertiary hospital, accredited by the TCM board. During the sessions, the area of acupuncture was first cleaned, and sterile needles were used under aseptic technique. However, four days post acupuncture therapy, the patient complained of severe worsening of her lower back pain, persisting even at rest. She was afebrile with no neurological deficits. Biochemical markers showed a Total White Cell Count of  $11.60 \times 10^9$  /per high power field, ESR of 50 mm/h, CRP 4.4 mg/dL, negative blood cultures and Mantoux test.

TAN JUN HAO, Medical Student, Yong Loo Lin School of Medicine, National University of Singapore

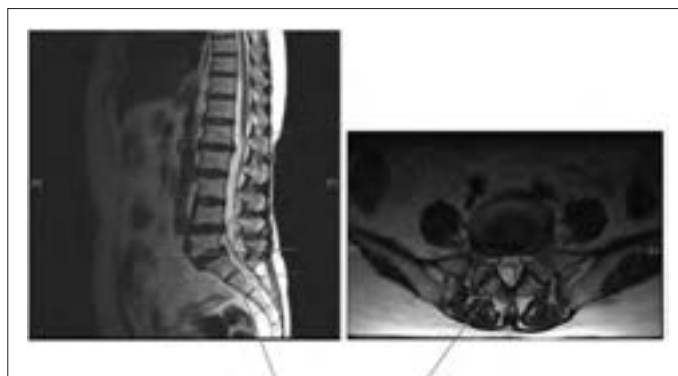
GABRIEL LIU, Assistant Professor and Senior Consultant Spine Surgeon, University Spine Centre, Department of Orthopaedic Surgery, National University Hospital, Yong Loo Lin School of Medicine, National University Health System

GURPAL SINGH, Associate Consultant Spine Surgeon, University Spine Centre, Department of Orthopaedic Surgery, National University Hospital, National University Health System

Figure 1: X-rays showing L5/S1 grade I spondylolisthesis and L4/L5 degenerative disc disease



Figure 2: MRI confirmed L5/S1 spinal stenosis

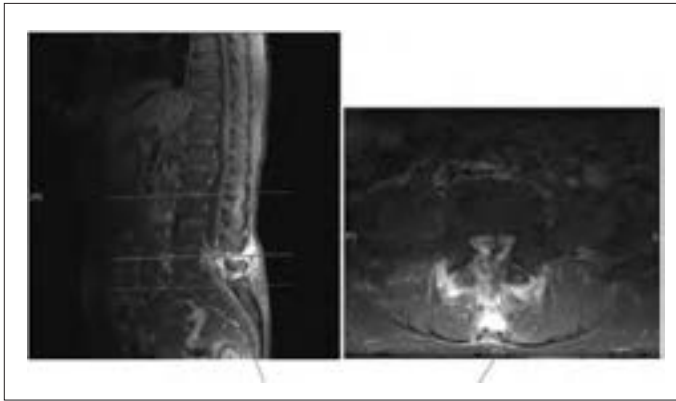


Repeat MRI with gadolinium showed bilateral L4/L5 facets and paraspinal muscle signal enhancement (Figure 3). Radiological diagnosis of septic facet arthritis was made by an independent radiologist consultant. Blood cultures and CT guided facet biopsy was negative. There was no confirmatory open biopsy performed due to patient's refusal.

In view of the patient's clinical symptoms, biochemistry and radiological findings, the combined decision of a diagnosis of septic arthritis of the spinal facet from the infectious disease physician, radiologist and spine surgeon was made. The patient was treated with empirical antibiotics and monitored with serial clinical examination, blood tests and MRI scans. The trends are illustrated in Figure 4 and 5.

A total of 6 months of antibiotic therapy were administered. Clinically, her back pain improved after 3-4 months of antibiotic therapy, ESR normalised in one year and radiological resolution was seen a year after treatment (Figure 5). For the management of the spinal infection, the patient underwent 4 hospital admissions for pain control, 6 follow-up MRI scans,

**Figure 3: Repeat MRI with gadolinium showed bilateral L4/L5 facets and paraspinal signal enhancement**



49 blood tests and pay an estimated total bill of S\$10,000, not including treatment of her primary back condition. Posterior spinal decompression, instrumentation and fusion was performed for the patient's spinal stenosis 2 years after the initial infection. Patient recovered well post-surgery with no back, no claudication symptoms and no signs of infection after 2 years post-operatively follow up.

#### GAINING INSIGHT: WHAT ARE THE ISSUES?

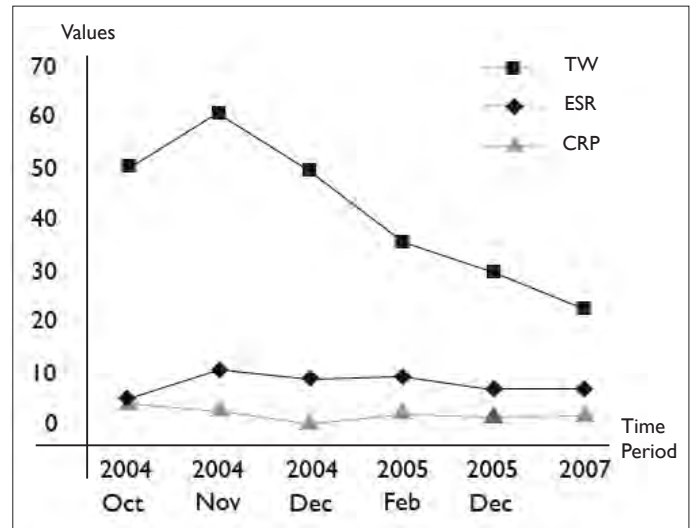
Acupuncture treatment complications are not well reported. Furthermore, septic arthritis of the lumbar facet joints is uncommon. Few case reports had been described in the literature<sup>1,2,3,4</sup>. Though most cases are haematogeneous in origin, these infections may occur secondary to needle procedures such as nerve root or facet blocks as well as acupuncture. In the above patient, it is demonstrated that septic arthritis of the lumbar facet joint is one of the possible rare complication of acupuncture therapy. In the year where our patient was diagnosed with septic arthritis, 9066 patients were treated with acupuncture in the same hospital. That makes the incidence of septic arthritis post-acupuncture to be 0.0001% (1 in 9066).

#### STUDY THE MANAGEMENT: HOW DO WE APPLY IN OUR CLINICAL PRACTICE?

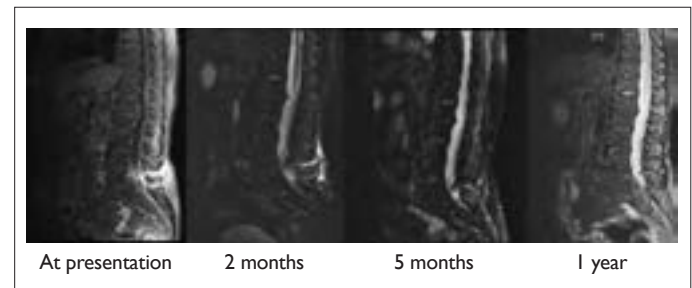
The incidence of lumbar facet arthritis is about 4% among all spinal infection<sup>5</sup>. The most common cause of lumbar septic arthritis is secondary to hematogenous spread from a non spinal origin<sup>6,7,8</sup>. Recent report of direct bacterial inoculation to the lumbar facets resulting from diagnostic or therapeutic procedures has been described<sup>8,9,10</sup>. The overall incidence of spinal infection occurring after discogram, facet or nerve blocks and epidural anaesthesia is estimated to be less than 1%. Epidural abscesses resulting from these procedures range from between 0.01-0.001%<sup>11</sup>. The most common causative organisms are staphylococcus aureus and staphylococcus epidermidis<sup>12</sup>.

Acupuncture is a commonly prescribed invasive type of treatment modality for back pain, especially in the Asian setting. Randomised prospective studies demonstrate that acupuncture

**Figure 4: Serial blood tests showing resolution**



**Figure 5: Serial MRI showing resolution**



provides better symptomatic control in these patients, compared to placebo cohort<sup>13</sup>. Acupuncture may reduce back pain by mechanism involving Gate Theory of pain or release of endorphins. The true incidence of acupuncture related spinal infection is unknown. However, Carragee et al reported the overall incidence of spinal infection occurring after discogram, facet and nerve block and epidural anaesthesia to be less than 1%, and epidural abscesses between 0.01-0.001%<sup>11</sup>. Despite the low incidence of spinal infections following spinal injections, the potential consequences of spinal invasive therapy can be serious. Irreversible neurologic deficits may result in cases of epidural abscess formation<sup>14</sup>. Even low grade infections result in a high morbidity and increased costs as illustrated in this case. The estimated incidence of septic arthritis is 0.0001 (1 in 9066).

The 1999 WHO guidelines on basic training and safety in acupuncture encourage aseptic technique, using sterile equipment and sterile preparation of needling sites<sup>26</sup>. There is however no current guidelines on the management of complications related to acupuncture.

The clinical course of the septic arthritis may be indolent and resemble symptoms from degenerative disc disease. Biopsy for culture is often negative and made the definitive diagnosis difficult. Although the studied patient's symptoms responded to antibiotics, the cost of the antibiotic treatment and the delay in diagnosis contributed to increased morbidity.

Daivajna et al described the pathological changes in facet joint septic arthritis involving destruction of the synovial joint surface and breach of the capsule<sup>15</sup>. Depending on the timing of diagnosis and further spread of infection, a paraspinal or epidural abscess may occur<sup>5,16,17,18</sup>. Hoelzer et al<sup>19</sup> and Hooten<sup>20</sup> reported that facet joint septic arthritis usually present in a clinically indolent fashion, patients may report fever, malaise or just a worsening of their back pain, as in this particular case. Radicular symptoms, if not previously present, may appear if there is nerve root irritation or impending spread of the infection into the epidural space. Multiple papers reported that the inflammatory markers (Erythrocyte Sedimentation Rate and Complement Reactive Protein) are usually raised but may not be markedly so<sup>12,21,22</sup>. Positive blood cultures in the correct clinical context may confirm the organism in 50% of the cases<sup>23</sup> but the preferred method of sampling is an image-guided biopsy. Biopsy is positive in 75% of times<sup>5</sup> and one of the common reasons for a negative result is that the patient is already on antibiotics at the time of biopsy. In these cases, the diagnosis rests on clinical and imaging grounds, together with the patient's response to antibiotic therapy and clinical as well as radiological resolution of symptoms. Magnetic resonance imaging (MRI) with gadolinium contrast is considered the imaging investigation of choice. Fujiwara et al reported that the changes can be detected as early as two days from onset of symptoms and accurate information can be obtained with regard to the extent of facet destruction<sup>24,25</sup>. Impending epidural abscess may be indicated by an abnormal fat signal<sup>9</sup>.

There is a role for conservative management with prolonged antibiotic therapy in cases of low grade infections, provided the patient can be followed up regularly. Antibiotics should not be started until cultures are obtained – either by open biopsy or image guided needle biopsy. Surgical debridement is indicated in cases of epidural abscess formation, or if there is persistence of symptoms and no improvement clinically, radiologically and on haematological investigations.

One of the limitations to the current study is the lack of statistical power of this case report to draw any definitive conclusion. Another limitation is the lack of positive bacterial culture from the facet due to the concurrence of antibiotics usage prior to the identification of the infection, making the diagnosis difficult. Nonetheless, with the increase of back pain after acupuncture, elevated biochemical markers and the MRI appearance of spinal infection around the facet, the diagnosis of septic arthritis was made.

## CONCLUSION

In conclusion, this case report serves to create awareness of the possible side effect of spinal infection among physicians routinely prescribing acupuncture as an adjunct treatment modality for low back pain. Patients with sudden onset of severe pathological

back pain even at rest after the treatment of acupuncture should lead to the suspicion of possible spinal infection as septic arthritis in the spine can occur via direct bacterial inoculation during acupuncture treatment. Although the infection rate after routine acupuncture treatment is very low (0.0001%), proper counseling of patients and explanation of risk-benefit ratios is necessary.

## Acknowledgement

The authors would like to thank Dr Tan Wee Chuan for his help in the manuscript.

## REFERENCES

1. Ergan M, Macro M, Benhamou CL, Vandermarcq P, Colin T, L'Hirondel JL, Marcelli C, Septic Arthritis of Lumbar Facet Joints, A Review of Six Cases, *Rev Rhum Engl Ed* 1997 Jun;64(6):386-95.
2. Michel-Batot C, Dintinger H, Blum A, Olivier P, Laborde F, Bettembourg-Brault I, Pourel J, Loeuille D, Chary-Valckenaere I, A Particular form of Septic Arthritis: Septic Arthritis of Facet Joint, *Joint Bone Spine* 2007 Aug
3. Ogura T, Mikami Y, Hase H, Mori M, Hayashida T, Kubo T, Septic arthritis of a lumbar facet joint associated with epidural and paraspinal abscess, *Orthopedics*. 2005 Feb;28(2):173-5.
4. Roberts WA, Pyogenic Vertebral Osteomyelitis of a Lumbar Facet Joint with associated Epidural Abscess: A Case Report with Review of the Literature, *Spine* 1988; 13(8):948-52.
5. Muffoletto AJ, Ketonen LM, Mader JT, et al. Hematogenous pyogenic facet joint infection. *Spine* 2001;26:1570-6.
6. Spinal Epidural Abscess Ann S. Baker, M.D., Robert G. Ojemann, M.D., Morton N. Swartz, M.D., and Edward P. Richardson, Jr., M.D. *N Engl J Med* 1975; 293:463-8.
7. Shaw BA, Kasser JR (1990) Acute septic arthritis in infancy and childhood. *Clin Orthop* 257:212-25.
8. Arch Orthop Trauma Surg (2001) 121 :90–92 Motomi Ishibe · Masayuki Inoue · Katsutoshi Saitou Septic arthritis of a lumbar facet joint due to pyonex.
9. Daivajna S, Jones A, O'Malley M, Mehdian H, Unilateral Septic Arthritis of a Lumbar Facet Joint Secondary to Acupuncture Treatment- A Case Report, *Acupunct Med* 2004 Sep 22(3): 152-5.
10. J Spinal Disord Tech. 2003 Jun; 16(3):285-7. Delayed presentation of septic arthritis of a lumbar facet joint after diagnostic facet joint injection. Orpen NM, Birch NC.
11. Carragee EJ, Pyogenic Vertebral Osteomyelitis, *J Bone Joint Surg Am* 1997; 79:874-80.
12. Calderone RR, Larsen JM, Overview and Classification of Spinal Infections, *Orthop Clin North Am* 1996; 27(1): 1-8.
13. Inoue M, Kitakoji H, Ishizaki N, Tawa M, Yano T, Katsumi Y, Kawakita K. Relief of low back pain immediately after acupuncture treatment--a randomised, placebo controlled trial. *Acupunct Med*. 2006 Sep;24(3):103-8.
14. Darouiche RO, Hamill RJ, Greenberg SB, Weathers SW, Musher DM, Bacterial Spinal Epidural Abscess: Review of 43 cases and literature survey. *Medicine (Baltimore)* 1992;71(6):369-85.
15. Daivajna S, Jones A, O'Malley M, Mehdian H, Unilateral Septic Arthritis of a Lumbar Facet Joint Secondary to Acupuncture Treatment- A Case Report, *Acupunct Med* 2004 Sep 22(3): 152-5.

16. Baltz MS, Tate DE, Glaser JA. Lumbar facet joint infection associated with epidural and paraspinal abscess. Clin Orthop Relat Res. 1997;339:109-12.
17. Heenan SD, Britton J. Septic arthritis in a lumbar facet joint: a rare cause of an epidural abscess. Neuroradiology. 1995;37:462-4.
18. Roberts WA. Pyogenic vertebral osteomyelitis of a lumbar facet joint with associated epidural abscess: A case report with review of the literature. Spine. 1988;13:948-52.
19. European Journal of Pain Volume 12, Issue 3, Pages 261-265, April 2008 Paraspinal abscess complicated by endocarditis following a facet joint injection Bryan C. Hoelzer, Toby N. Weingarten, W. Michael Hooten, R. Scott Wright, Walter R. Wilson, Peter R. Wilson
20. Seminars in Pain Medicine Volume 2, Issue 4, December 2004, Pages 208-214 Complications of Pain Therapies Infectious complications of commonly performed spinal injections W. Michael Hooten MD
21. Malaysian Orthopaedic Journal 2010 Vol 4 No 2 Septic Arthritis of Lumbar Facet Joint with Co-Existing Spondylolisthesis – A Case Report. C Khoo, MBBS (IMU), S Thevarayan, MBBS (RGUHS), P Rengsen, MS Ortho (UM), AS Deepak\*, MS Ortho (UM)
22. Sapico FL, Montgomerie JZ. Pyogenic Vertebral osteomyelitis: report of nine cases and review of the literature. Rev Infect Dis 1979; 1(5): 754-6.
23. Acta Orthop. Belg., 2004, 70, 290-294 Septic arthritis of a lumbar facet joint Case report and review of the literature Mahmoud SMIDA, Mejed LEJRI, Hajer KANDARA, Meriem SAYED, Ferid BEN CHEHIDA, Maher BEN GHACHEM
24. Fujiwara A, Tamai K, Yamato M, et al. Septic arthritis of a lumbar facet joint: report of a case with early MRI findings. J Spinal Disord 1998;11:452-3.
25. Hadjipavlou AG, Cesani-Vasque F, Villanueva, Meyer J, Mader JT, Necessary JT, Crow W, et al. The effectiveness of gallium citrate Ga-67-radiionuclide imaging in vertebral osteomyelitis revisited. Am J Orthop 1998; 27 (3): 179-83.
26. Guidelines on Basic Training and Safety in Acupuncture, WHO guidelines 1999.