Early Diagnosis of Pyogenic Spinal Infection

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The incidence of spinal infection is 0.2-2.0 cases / 10,000 hospital admissions and is rising due to factors that predispose to spinal infection, including diabetes mellitus, intravenous drug abuse, spinal instrumentation and medical comorbidities such as hepatic, renal or cardiac failure are becoming more prevalent[1-3].

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His main interests include the treatment of scoliosis in children, the management of back pain, spinal trauma, spinal infection and medico-legal issues. He is involved in the development of new treatments for scoliosis in children.

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The trilogy of spinal pain, fever and a neurological deficit supports a clinical diagnosis of spinal infection, but patients are often apyrexial or pyrexia is modest. Spinal pain occurs in 67% of patients, motor weakness 52%, fever 44%, sensory abnormalities 40%, and sphincter involvement 27%[3]. Spinal pain lacks diagnostic specificity. Red flags for spinal infection include: age <20 or >55, pain in recumbency, constant progressive non-mechanical pain, fever, neurological deficit, deformity, thoracic pain, immunosuppressive illness or tenderness to palpation/percussion. Leucocytosis is present in 60% of patients, the white cell count is often only modestly elevated[4]. The ESR is usually elevated[4]. The CRP is almost universally elevated[5].

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Delayed diagnosis occurs in 11-75% of cases[6,7] and is associated with a six times greater proportion of patients with permanent neurological deficit[7].

We reviewed the files of 45 litigants with pyogenic spinal infection. Diagnostic delay occurred in 93% of these medico-legal cases with an average delay of nine days. All patients were ambulant at presentation (ASIA C-E). Neurological deterioration occurred in 82%; 31% (14/45) deteriorated to complete motor and sensory paraplegia at final follow-up (ASIA A) (Table 1).

Diagnosis Initial	A	B	C	D	E
A	0	0	0	0	0
B	0	0	0	0	0
C	2	0	1	0	1
D	1	2	3	2	0
E	11	1	11	6	4

n = 45

Table 1: Frankel grades at initial presentation and at time of diagnosis

The failures leading to delay in diagnosis and treatment were as follows:

Not to consider differential of infection	23 (51%)
Not to consider thoracic pain as red flag	25 (55%)
No haematology	8 (17.7%)
Not to act on abnormal haematology	29 (64%)
Not to recognise abnormal neurological findings	20 (44%)
Not to act on pyrexia	8 (17.7%)

(N=45)

Heusner[8] has stratified the clinical findings in pyogenic spinal infection, which is a useful way

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of stratifying patients and predicting outcome (Table 2). The ideal is to diagnose patients in groups I and II, those in group three have a very poor outcome unless they are treated as an emergency. Once patients progress to group IV, recovery in unfortunately much less likely, and in our study only 2/15 patients made a recovery (from ASIA A to ASIA C and D).

In general, patients with spinal infection and neurological deficit are expected to have a reasonable chance of recovery, for example, in patients with tuberculosis. However, we excluded patients with tuberculosis from this study and we noted that there were very few litigants with tuberculosis, perhaps because they less commonly have a long-term neurological deficit. We noted that the patients with tuberculosis tended to have a better long term outcome.

Early diagnosis prior to a neurological deficit is the ideal. Triage systems based upon risk factors for infection are needed[5-7]. The CRP should be measured in all suspicious cases, it is almost invariably raised in spinal infection (>50 in 44/45 of our patients, 98%), which confirms an infectious pathology prompting early diagnostic MRI and treatment. The burden to patients and the cost of compensation can be very high where there is a delayed diagnosis of spinal infection.

Phase	Neurological deficit
I	None. Spinal pain only
II	Radiculopathy (impairment of nerve root function with radicular pain and/or radiating paraesthesia)
III	Spinal cord compromise: objective neurological deficits of spinal cord compression including motor weakness, sensory impairment and/or bladder or bowel dysfunction
IV	Complete motor and sensory paraple

Table 2: Heusner Grading Scale

In conclusion consider infection as the primary cause of pain in patients with severe spinal pain especially if they may be immune-compromised. If the CRP is higher than 50, then an emergency MRI scan should be considered, and any source of infection will be diagnosed. Timely treatment will usually arrest neurological deterioration and healing of the spine after surgery is almost universal. ■

References

References can be found online at www.boa.ac.uk/publications/JTO