

# Spondylodiscitis in People who Misuse Drugs by Injection: A Case Series of Maltese patients

## INTRODUCTION

Spondylodiscitis is associated with significant morbidity and some mortality. This case series describes the diagnosis, management, and outcome of 11 patients who were diagnosed with spondylodiscitis over a period of 10 years. Information about the presentation, diagnosis and management of the patients was extracted from the summaries provided to patients on discharge from hospital. Access to such information was consented to by the patients. All patients were known to misuse drugs by injection and had been in contact with treatment services for a number of years before the onset of the infection. This case series highlights the possible deterioration in the quality of life of patients diagnosed with spondylodiscitis, especially if diagnosis and treatment are delayed. It also tries to impress the importance for health care professionals to facilitate and actively promote the engagement of patients who misuse drugs by injection with care and treatment services, if diagnosis and treatment of this condition are to be effective and result in less morbidity.

## CASE PRESENTATION AND DIAGNOSIS

The studied patients were diagnosed with spondylodiscitis over a 10-year period, between 2012 and 2021. The patients were in contact with services provided at the Substance Misuse Outpatient Unit (SMOPU), a community-based clinic in Malta providing comprehensive services to people with a substance use disorder. Doctors working at this clinic were asked to identify patients attending SMOPU who were referred or treated for spondylodiscitis. This case series refers to 13 episodes of spondylodiscitis in 11 different patients (Table 1).

Table 1. Yearly incidence of spondylodiscitis encountered by doctors at SMOPU over the years.

Year	Number of cases
2012	1
2013	1
2014	0
2015	1
2016	3
2017	0
2018	1
2019	0
2020	3
2021	3

The mean age of the patients in this case series was 36.5 years (range: 28 to 43 years). Four of the 11 patients were female.

Back pain was mentioned by all patients in their presenting complaint (Table 2) except in one patient with impaired level of consciousness at time of referral to hospital. Six patients were febrile at time of presentation. Complaints of a neurological nature were mentioned in less than half of the patients at time of presentation, in the form of paraesthesia and weakness of the limbs (five patients).

Table 2. Most common symptoms of patients with spondylodiscitis seen at SMOPU.

Most common presenting complaints
Back pain
Fever
Neurological signs (paraesthesia and weakness of limbs)

Two patients were referred to Mater Dei Hospital (MDH) with a diagnosis of spondylodiscitis, following magnetic resonance (MR) imaging of the vertebral column outside hospital. 10 patients who were referred to MDH had MR imaging done while in hospital as part of the various investigations to confirm the diagnosis. On one occasion, the MRI was taken solely after the patient was discharged. Four patients also had additional MR imaging done after discharge from hospital as part of the management plan at follow up. MR imaging showed that in this case series the lumbar level of the vertebral column was more often involved (Table 3).

Table 3. The specific vertebral column section affected by spondylodiscitis as identified by MRI.

Part of vertebral column involved	MRIs taken
Cervical	4
Thoracic	3
Lumbar	6

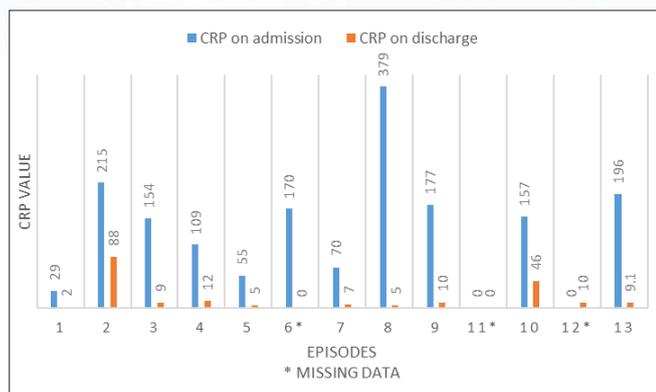
Most of the patients managed in this case series were admitted under the care of an infectious disease specialist. A minority of patients were admitted under other specialities (Table 4).

**Table 4.** Patients with spondylodiscitis referred to MDH were assigned to consultants with different specialisations.

Speciality caring for patients	Admissions
Infectious disease	9
Orthopaedics	2
General medicine	1
Neurology	1

Inflammatory markers in the form of erythrocyte sedimentation rate (ESR) and C-reactive protein (CRP) were measured in most patients in order to follow the progress or otherwise of their condition. In this case series CRP was the investigation more often used. Figure 1 clearly shows the fall in CRP levels as patients responded to treatment.

**Figure 1.** CRP value over the treatment course.



10 out of 12 blood cultures grew *Staphylococcus aureus*, of which 2 were methicillin-resistant. In three cases no bacteria were grown on culture. Four patients underwent CT-guided aspiration in an effort to identify/confirm the infective organism. Of these, two had blood cultures. Seven patients had an echocardiogram done.

### MANAGEMENT

All patients were administered parenteral antibiotics. Parenteral administration of antibiotics lasted a few weeks. In 10 out of 13 treatment episodes an indwelling intravenous catheter was deemed necessary to facilitate this. All patients were changed to oral antibiotics before discharge from hospital. Multiple antibiotics, often administered concurrently with frequent changes made it extremely challenging to follow the order in which they were prescribed, since the primary source of information was the discharge summary. The following is a list of the various antibiotics mentioned in the patients' discharge summaries: Penicillins [flucloxacillin, piperacillin/tazobactam], Fluroquinolones [levofloxacin, ciprofloxacin], Glycopeptides [teicoplanin,

vancomycin], Cephalosporins [ceftriaxone], Nitroimidazoles [metronidazole], Lincosamides [clindamycin], Carbapenems [meropenem], Sulfonamides [co-trimoxazole], and Tetracyclines [doxycycline]. Six patients required surgical intervention at the time of hospitalization as part of the management of spondylodiscitis.

### OUTCOME

Eight patients remain in contact with SMOPU at time of writing. One other patient passed away 12 months after the episode of spondylodiscitis, with the cause of death related to cardiac complications. These eight patients still in contact remain generally well, though some with less-than-optimal health, even as a consequence of the spondylodiscitis.

### DISCUSSION

Osteomyelitis of the vertebral bodies and infection of the intervertebral discs and surrounding tissues is a rare condition more often seen in an elderly population. An incidence of up to 6.5 per 100,000 in those over the age of 70 is described. Incidence is lower in the younger population at 0.4 to 2.4 per 100,000. Incidence is noted to be increasing.<sup>1</sup> Possible factors contributing to the increase include an ageing population, increased prevalence of chronic diseases and immunosuppressive therapies. Diabetes and drug injecting in people who use drugs are among the more common chronic diseases that predispose to osteomyelitis.<sup>2</sup> Osteomyelitis is more common in people who misuse drugs by injection as they tend to have multiple infected sites such as skin and soft tissue infections, abscesses, and foreign bodies such as broken needles at sites of injecting and an increased prevalence of dental and gum disease. Osteomyelitis of the vertebrae and intervertebral discs is a common site in people who inject drugs.<sup>2</sup>

With a mean age of patients in this case series being 36.5 years, this is by far a younger aged population compared to the age of patients usually developing spondylodiscitis. This is expected considering that the studied patients were people who misuse drugs by injection. This is also the more common age group of patients who access services provided by SMOPU. Patients developing this condition had been in contact with treatment services for an average of 14 years (range: 4 to 25 years). In this case series it is noted that the last two years included in the study were the two years when more patients were diagnosed with this condition (Table 1).

One patient in the case series was admitted to hospital and treated for spondylodiscitis on 3 separate occasions. The time between the first and second episode was of 13 months and 6 months between the second and third. In all 3 episodes the infection was at the level of the lumbar vertebrae, with the earlier episode involving the second lumbar vertebra and the latter episode 19 month later, the fifth. The patient was discharge from hospital when the health care providers considered it reasonable to

change to oral antibiotics. The patient claimed to have been compliant to oral antibiotics as advised at time of discharge from hospital. It is difficult to say whether the recurring spondylodiscitis was an exacerbation of previously unresolved infection or recurring in an individual successfully treated for the same condition but known to have persisted with drug injecting. Another two patients in the series required readmission for further care of spondylodiscitis, but it is assumed that management during the first admission was incomplete as the patients discharged themselves from hospital against medical advice.

Though less females than males were represented in this case series, the ratio female to male diagnosed with spondylodiscitis (1:1.8) is higher than the female to male ratio of patients making use of services at SMOPU, which stands roughly at 1:4. Females diagnosed with spondylodiscitis in this study were 4 years younger compared to males at time of diagnosis (females: 33.8 years, males: 37.8 years). The onset of spondylodiscitis after having established contact with SMOPU services is slightly shorter in females (12.6 years) compared with males (13.4 years). These gender disparities are an indication, also supported in the literature,<sup>3</sup> that females are likely to be involved in more risky behaviours than males and that they tend to develop complications secondary to drug use and injecting earlier than males.

**Table 5.** Gender differences in patients with spondylodiscitis noted in this study.

Gender disparities
Proportionately more females infected
Females developing condition at a younger age
Females developing condition earlier following contact with services

In this case series, nonspecific symptoms lingered for an average of 5 weeks (range: 1 to 16 weeks) until a diagnosis was made, and appropriate treatment started. Various factors are known to have contributed to the delay in diagnosis. Backpain in two of the patients was put down to pain of musculoskeletal origin with no further investigations recommended until the patients returned with deteriorating symptoms. One patient was involved in a motor vehicle accident and symptoms (neck pain and upper limb paraesthesia) attributed to a whiplash injury. Another patient complaining of severe neck pain and a history of cervical radiculopathy was referred back from hospital to primary care with no explanation for a spiking temperature. Some patients admitted having delayed presenting to care services as they did not think much of the symptoms they were suffering from.

All patients had MR imaging done at some stage in the course of the management. Some had more than one done (Table 6). This highlights the importance of this investigation in the diagnosis and further management at time of treatment and follow up.

**Table 6.** MRI investigations carried out during this review.

Timing of magnetic resonance imaging	MRIs taken
Pre-hospital	2
In-patient	10
Post-discharge	4
Pre-hospital and in-patient	1
In-patient and post-discharge	2
Pre-hospital and post-discharge	1

Another important investigation done in most patients in this case series is the serial estimation of inflammatory markers. Non-specific blood markers include an elevated white cell count, ESR and CRP. Elevated inflammatory markers, though not pathognomonic for this condition, have been recommended as a possible screening tool when the clinical presentation is indicative.<sup>4</sup>

In this case series antibiotics were withheld until culture and sensitivities were available to guide choice of antibiotics (Table 7). In three cases sampling did not culture any organisms. Literature describes this as happening in up to 40% of cases, rendering the choice of antibiotic less straight forward.<sup>4,5</sup>

**Table 7.** Biopsy and culture.

Sampling type prior to start of antibiotics	Samples taken
Blood cultures	12
CT-guided biopsies	4
Blood cultures after CT-guided biopsies	2

One patient had no specimens (neither blood nor material from site of infection) sent for cultures due to early discharge against medical advice. This patient was admitted to hospital 12 months later and diagnosed with infective endocarditis and a splenic abscess. It is reasonable to speculate whether the untreated episode of spondylodiscitis in this patient contributed to the development of the serious complications a year later. Two patients were diagnosed with infective endocarditis while in hospital being treated for spondylodiscitis. Both these patients had blood cultures which grew *Staphylococcus aureus*. Seven patients had an echocardiogram done while in hospital being treated for spondylodiscitis. Literature recommends transoesophageal echocardiography in all patients diagnosed with spondylodiscitis.<sup>6</sup>

Literature indicates that people who use drugs might not be compliant to antibiotic treatment if discharged too early from hospital.<sup>7</sup> This might explain the prolonged hospital stays. In this case series, patients' hospital stays when not discharged against medical advice (two patients), lasted a mean of 29.7 days (range 15 to 52 days). While the prolonged need for venous access is likely to determine the insertion of central catheters in most cases, one must keep in mind that peripheral venous access is particularly difficult in this population of patients, further making it more likely to resort to a central line insertion. None of the 10 patients requiring a central line were discharged from hospital while still on parenteral antibiotics and therefore there was no need to discharge with a central (or peripherally inserted) line. All patients were changed to oral antibiotics at time of discharge from hospital. The average duration of antibiotic treatment (both parenteral and oral) was of 10.5 weeks. Some centres abroad do resort to the practice of patients being discharged with indwelling central lines in an effort to reduce the duration of hospital stays. Such a practice requires an outpatient service that closely monitors and cares for such patients. Fear of relapse to intravenous use of drugs might present a dilemma in deciding who is more likely to benefit from earlier discharge while still on parenteral antibiotics. In people who inject drugs such intervention remains debatable. While prolonged hospital stays are expensive the aim should be to provide appropriate care to this vulnerable population.<sup>2,7,8</sup>

Two of the 6 patients requiring surgery required this urgently to decompress the spinal cord at the cervical level. Three patients, including the two who required an urgent intervention at the time of the initial hospitalization, required elective surgery at a later stage to restore spinal alignment and correct instability. Two patients in this case series required dental care while in hospital being treated for spondylodiscitis.

Cure in uncomplicated pyogenic spondylodiscitis is achieved in 86 to 91% of cases.<sup>9</sup> While the infection itself is treatable, up to a third of patients will suffer some physical sequela from this condition as was the case in this series of patients treated for spondylodiscitis.

## LIMITATIONS OF THIS STUDY

Asking doctors working at SMOPU to recall patients cared for or referred to further care with spondylodiscitis over a period of 10 years might have resulted in some patients being missed. Another limitation of this study is that information about diagnosis and management not mentioned in the discharge summaries provided to patients at time of discharge from hospital was not available to the author.

## CONCLUSION

Spondylodiscitis is an uncommon but serious disease seen at a younger age in people who inject drugs. It is worth remembering that patients who currently or recently injected drugs, should alert a health care professional to afford more time in their assessment if they are sickly and febrile. Early diagnosis and management by specialized treatment services usually results in a favourable outcome. Quality of life after an episode of spondylodiscitis does not always return to the premorbid state. It is important that people who use drugs who are treated for spondylodiscitis remain in contact with treatment services after discharge from hospital. This should help prevent hospital admissions or allow early intervention should there be a return to behaviours known to be risk factors for this and other serious diseases. Care services to people who use drugs must remain easy to access, even to enable the more vulnerable among them such as females, to establish and maintain contact.

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