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Original Article

Epidemiologic Features and Surgical Treatment of Spontaneous Pyogenic Spondylodiscitis in Bangladesh

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Abstract

Background: *Spontaneous pyogenic spondylodiscitis is an uncommon clinical condition. But in our country it is not infrequent. High level of clinical suspicion is necessary for diagnoses of spontaneous pyogenic spondylodiscitis. There is no study regarding this issue in Bangladesh.*

Objective: *The objective of this study was to see the epidemiological feature and types of surgical treatment of spontaneous pyogenic spondylodiscitis in Bangladesh*

Materials and Methods: *This is a retrospective observational study. This study was done in the Department of Neurosurgery, National Institute of Neurosciences and Hospital, Dhaka, Bangladesh. The study period was January, 2016 to July, 2021 for a period of 5.5 years. 17 patients who were undergone surgery included in the study. The data were collected from questionnaires and hospital records and analyzed.*

Results: *In our study the highest incidence was found in 4th (23.52%) and 6th (29.42%) decade of life which was around 53%. The male to female ratio was about 2: 1.The present study showed the most common involvement was in lumbar region (35.31%), in dorsal and sacral region it was 23.52% and the cervical region in 17.65%. Regarding surgical treatment in cervical region both anterior (with fixation) and posterior approach was done, in dorsal, lumbar and sacral region posterior approach with or without fixation was done.*

Conclusion: *In Bangladesh the incidence of Spontaneous pyogenic spondylodiscitis is relative high. It is more common in advance age with male predominance. Most frequently affected region was lumber. Surgical technique was individualized for every case.*

Keywords: *Spontaneous pyogenic spondylodiscitis, epidemiology, surgical treatment.*

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Introduction:

Spontaneous pyogenic spondylodiscitis is an uncommon but important clinical problem that often requires aggressive medical and surgical management. The spectrum of spinal infections includes discitis, osteomyelitis, epidural abscess, meningitis, subdural empyema and spinal cord abscess. Pyogenic vertebral osteomyelitis, or pyogenic spondylodiscitis, represents approximately 2-7% of all cases of osteomyelitis[1, 2]. The incidence of spondylodiscitis ranges from 4 to 24 per million per year in developed countries[3, 4]. There is no data about

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the incidence in Bangladesh. The incidence has increased in the last years, as a result of the higher life expectancy of older patients with chronic debilitating diseases, the rise in the prevalence of immune suppressed patients and intravenous drug abusers. In our country poor nutritional status, low socio-economic condition, unhygienic living environment may contribute high incidence. Another reason of the increased incidence is the availability of more effective diagnostic tools[5].

Spontaneous pyogenic spondylodiscitis is in most cases a hematogenous infection. The most likely route of infection is arterial. The spinal arteries bifurcate to supply the adjacent vertebrae, so that the infectious process often involves two bony segments. In adults, the intervertebral disc is avascular since the spinal arteries are terminal arteries. Thus, a septic embolus may produce bony ischemia and infarction, with subsequent bone destruction, extension to the contiguous disc space, instability and spread to the paravertebral soft tissues, which define the characteristic features of pyogenic spondylodiscitis. pyogenic spondylodiscitis is, thus, frequently the consequence of hematogenous seeding of distant infectious foci. Typically this may occur in the presence of bacterial endocarditis, due to persistent bacteremia. The association between pyogenic spondylodiscitis and endocarditis is well established. Up to one third of the patients with pyogenic spondylodiscitis may be diagnosed with endocarditis, whereas in 2-20% of patients with endocarditis may be complicated by spondylodiscitis[6]. Although less often than by the arterial route, also the venous circulation may play a role in the pathogenesis of pyogenic spondylodiscitis. A retrograde flow may occur from the pelvic plexus to the paravartebral plexus, which is more likely to occur when there is an increased intra-abdominal pressure. In such circumstances an infection of the pelvic organs can spread to the spine[7]. More rarely, a retrograde venous flow may transmit an infection from the retropharyngeal space to the vertebrae, through the retropharyngeal venous plexus[8]. The common organisms include Staphylococcus aureus and streptococcus species and in intravenous drug abusers Gram-negative bacilli are frequently isolated. Mycobacterium tuberculosis, fungal infections and parasitic infestations are uncommon but are usually seen in immune compromised patients[9].

The treatment of pyogenic spontaneous spondylodiscitis is either conservative or surgical. In our study all patients were treated surgically. The aim of this study was to see the epidemiological feature and types of surgical treatment of pyogenic spondylodiscitis in Bangladesh.

Materials and Methods:

This is a retrospective observational study. This study was done in the Department of Neurosurgery, National Institute of Neurosciences and Hospital, Dhaka, Bangladesh. The study period was January, 2016 to July, 2021 for a period of 5.5 years. All patients with the diagnoses of spontaneous pyogenic spondylodiscitis and treated surgically were included in this study. Total 17 patients were recruited for this study. The patients with tubercular spondylodiscitis and postoperative spondylodiscitis were excluded from the study. The patients who were not willing to include the study were also excluded. Data were collected in prescribed questionnaires and also from the hospital records. Informed written consent of the patient was taken and all privacy was maintained.

Results:

In our study the highest incidence was found in 4th (23.52%) and 6th (29.42%) decade of life which was around 53%. In general most of the patients were from advance age of life. In our study 11(65%) were male and 6(35%) were female. The male to female ratio was about 2: 1.The present study showed the most common involvement was in lumbar region (35.31%), in dorsal and sacral region it was 23.52% and the cervical region in 17.65%. In our study all patients were treated surgically. Out of 17 patients, in cervical region 1(5.88%) patient was treated by posterior approach and other 2 (11.76%) patients were treated by anterior approach. In anterior approach fixation were done by plate and screws. In dorsal region all 4 (23.52%) patients were approached from posterior and drainage of pus were done by laminectomy. But in lumbar and sacral region 5 (29.42%) patients were treated by laminectomy and remaining 5 (29.42%) patients were treated by laminectomy and fixation by transpedicular screws and rods.

Table-I

Distribution of patient by age

Age group	Frequency	Percentage
1-10	0	00
11-20	1	5.88
21-30	1	5.88
31-40	4	23.52
41-50	3	17.65
51-60	5	29.42
61-70	3	17.65
Total	17	100

Table-II
Region of involvement

Region	Frequency	Percentage
Cervical	3	17.65
Dorsal	4	23.52
Lumber	6	35.31
Sacral	4	23.52
Total	17	100

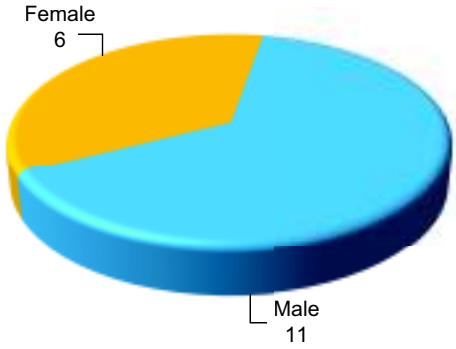


Fig.-1: *Distribution of patient by sex*

Table-III
Types of surgery done

Region	Types of surgery	Frequency	Percentage
Cervical	Laminectomy & Drainage of pusAnterior Approach(ACDF)	12	05.8811.76
Dorsal	Laminectomy & Drainage of pus	4	23.52
Lumber & Sacral	Laminectomy & Drainage of pusLaminectomy & Fixation	55	29.4229.42
	Total	17	100

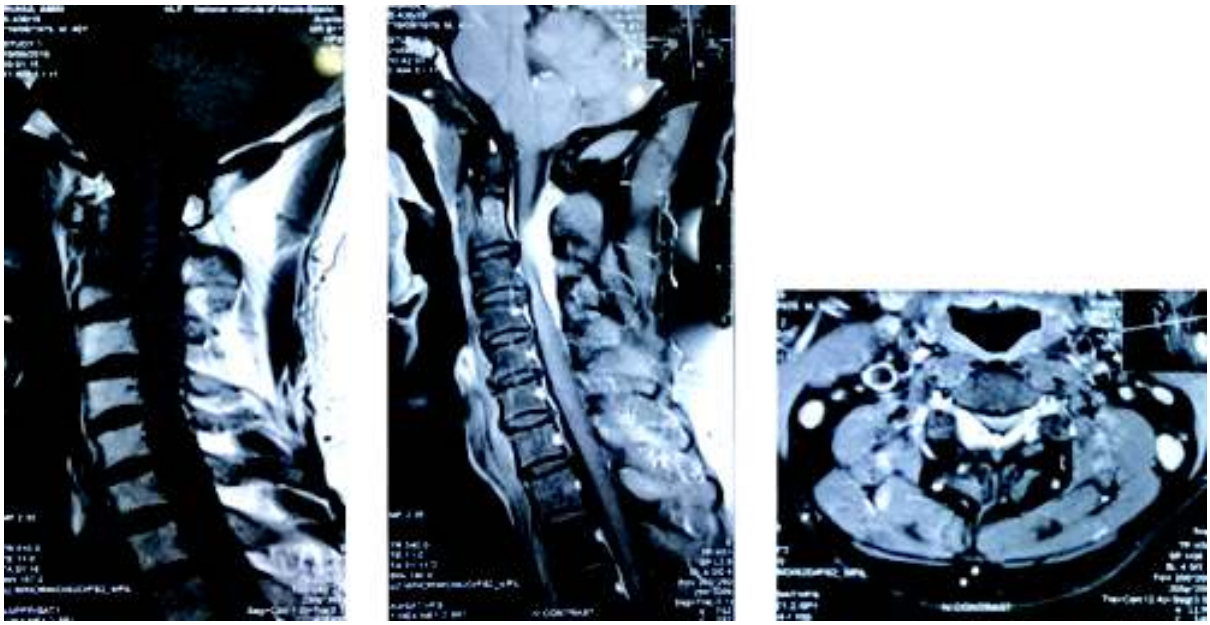
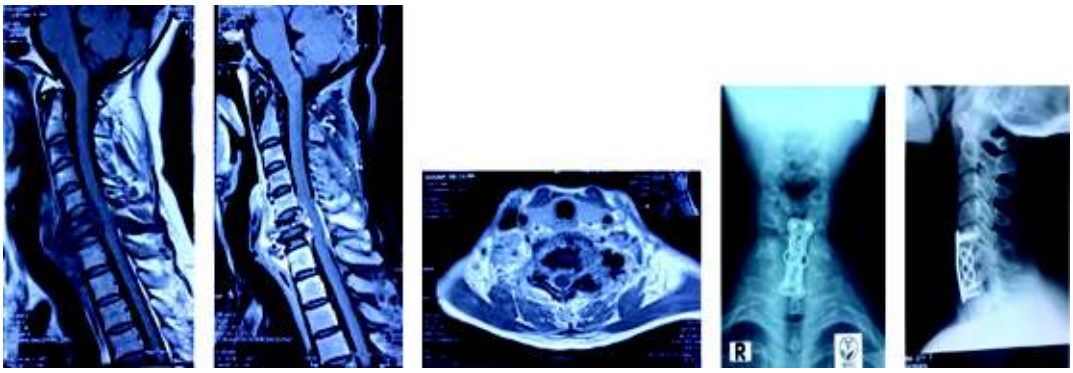


Fig.-2: *Collection of pus in cervical region posterior to cord extending from C2 to C4 vertebral body.*



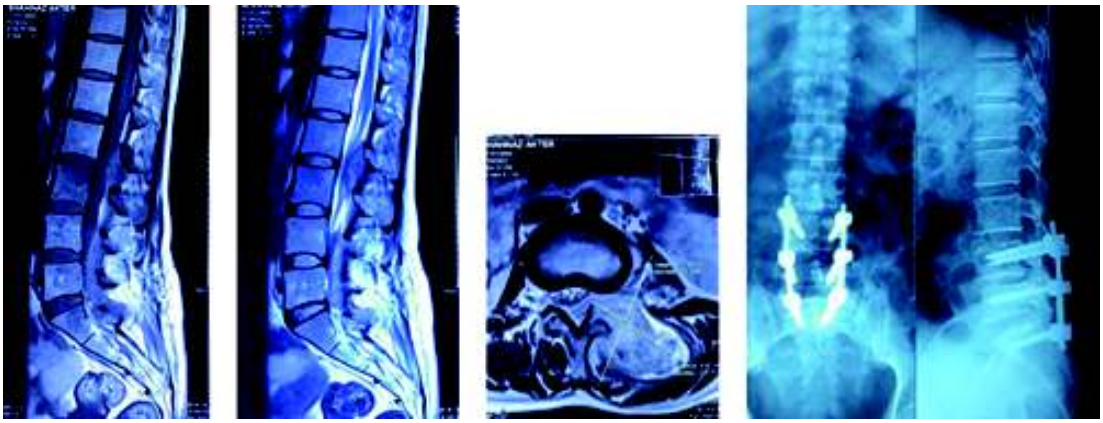
Pre op MRI Post op X-ray

Fig.-3: *Collection at C6 vertebral body with extension to preverteral region and within the canal with intact intervertebral disc.*

Fig.-4: *Collapse of D9 vertebral boy with huge collection of pus posterior to cord extending from D7 to L2 level.*

Pre op MRI Post op X-ray

Fig.-5: *Collection of pus in lumbar region posterior to cord extending from L2 to L4 vertebral body.*



Pre op MRI Post op X-ray

Fig.-6: *Collection of pus in lumbar region posterior to cord extending from L2 to S1 vertebral body with extension to left paraspinal muscle.*

Discussion:

Spontaneous pyogenic spondylodiscitis is usually not recognized at an early stage, when the treatment is simple and effective, due to the non-specific nature of the symptoms at the onset of the disease. Early diagnosis is based on a high level of suspicion[9]. Sapico and Montgomerie reported that 50% of patients had symptoms lasting for greater than 3 months before the diagnosis is established[10]. In our study the highest incidence was found in 4th (23.52%) and 6th (29.42%) decade of life. In general the aged people were more affected in Bangladesh. In many studies a bimodal age distribution is reported, with peaks at age less than 20 years and in the group aged 50-70 years [11, 12]. Another study showed the average age at clinical presentation is in the fourth to fifth decades which correlate with our study. In our study 11(65%) were male and 6(35%) were female. The male to female ratio was about 2: 1. In other study the males are more commonly affected than females in the ratio of 2:1 for unknown reasons. The present study showed the most common involvement was in lumbar region (35.31%), in dorsal and sacral region it was 23.52% and the cervical region in 17.65%. Whereas other study showed the most common level of involvement is in the lumbar spine, followed by the thoracic, cervical and sacral levels[13]. Involvement of the cervical spine occurs in 6.5% of spinal infections, whereas thoracic involvement has been reported to occur in 35% of cases.

The choice of surgical techniques and appropriate approaches, instrumentation and staging to treat pyogenic spondylodiscitis is still a matter of controversy. Options include anterior or posterior approach, single-stage or two-stage surgery, with or without instrumentation[14], but the decision about the surgical approach and technique should be always guided by the determination of the state of neurological threat or mechanical Instability[15]. Laminectomy alone is contraindicated in pyogenic spondylodiscitis because it may increase spinal instability. Laminectomy is indicated only for primary epidural abscess or granulation tissue causing neurocompression[16]. In our study all patients were treated surgically. Among 17 patients in cervical region 1 patient was treated by posterior approach (Figure-2) and other 2 patients were treated by anterior approach (Figure-3). In anterior approach fixation were done by plate and screws. In dorsal region all 4 patients were approached from posterior and drainage of pus were done by laminectomy (Figure-4). But in lumbar and sacral region 5 patients were treated by laminectomy and remaining 5 patients were treated by laminectomy and fixation by transpedicular screws and rods (Figure-5,6). Most of study was similar to us. Moreover, recently the minimal invasive posterior stabilization has been proposed as a efficient alternative to open surgery in elderly with severe co morbidities. Possible advantages and limitations of this technique are also reported.

Conclusions:

Spontaneous pyogenic spondylodiscitis is an uncommon entity. But in a poor country like Bangladesh the incidence is a bit high. Poor nutritional

status, low socio-economic condition, unhygienic living environment may contribute the high incidence. It is more common in advance age with male predominant. Lumbar region of the spinal cord are mostly involve. The surgical technique depends on the region of involvement, presence of bony destruction and availability of facilities. The outcome of surgical treatment is good.

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