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Outcome of posterior instrumentation with interbody grafting in management of lumbar spondylodiscitis

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***Abstract*---Background:** spondylitis is a serious spinal infection that can be effectively managed with conservative treatments in most cases, while severe conditions may necessitate surgical intervention. The choice of surgical approach remains diverse, with ongoing debate about using spinal instrumentation when an infection is active.Bone grafting, particularly using local techniques, plays a vital role in both the stabilization and structural reconstruction of the spine, contributing to improved long-term outcomes in the treatment of spondylodiscitis. **Aim:** This work reviews the diagnosis, management, and evaluation of posterior instrumentation with bone grafting in spondylodiscitis, focusing on its safety, effectiveness, as well as radiological and clinical results. **Patients and methods:** This prospective study followed 30 spondylodiscitis patients treated between August 2021 and March 2024, with a minimum 6-month follow-up. It was conducted at Al-Azhar University Hospital and Shebin Elkom Neurosurgery Hospital. **Results:** A total of thirty patients took part in the study, with a mean age of 50 years. The group consisted of nine females and twenty-one males**.**, with previous spinal procedures and diabetes as common risk factors. Symptoms lasted 2-24 weeks with the most prevalent pathogen being

Staphylococcus aureus.,. Surgery, mainly due to treatment failure, included posterior instrumentation and interbody grafting. Complications occurred in 20% of cases, all resolved without lasting effects. Follow-up showed significant improvement in clinical, laboratory, and radiological outcomes. **Conclusion:** Early-stage spondylodiscitis usually responds to conservative treatment, while surgery with instrumentation helps advanced cases. Posterior instrumentation with interbody grafting is effective for lumbar spondylodiscitis in selected patients. Complete debridement prevents infection recurrence and reduces prolonged antibiotic use or hospitalization.

***Keywords*---**Lumbar Spondylodiscitis, Interbody Grafting, Bone grafting

Introduction

Osteomyelitis of the spinal column, characterized by infection and damage to the vertebral bodies, beginning at the endplates and progressing to the intervertebral discs, is referred to as spondylitis. "Spondylodiscitis" refers to an infection of the intervertebral disc that is primary, with secondary infection of the nearby vertebrae[1].

Conservative treatment works well for the majority of spondylodiscitis patients. Although medicine can eradicate the infection, it may not stop the development of abnormalities in sagittal and coronal alignment that could cause chronic pain. Therefore, after the infection has resolved, it is imperative to keep an eye out for any structural changes[2].

When there is significant endplate destruction, abscesses, or chronic osteomyelitis resulting in biomechanical instability, surgery is recommended for severe spondylodiscitis. Additionally, it is required in cases of kyphosis, severe pain, neurological impairments, or the onset of septic pseudoarthrosis. Additionally, if conservative measures are ineffective in managing the condition, surgery might be necessary. Early detection of these issues is essential to halting additional harm and enhancing patient outcomes[3].

There are several surgical options available for treating spondylodiscitis, including single-stage or two-stage procedures, anterior and posterior approaches, and more. Depending on the specific situation, these might or might not involve spinal instrumentation. Nonetheless, there is ongoing discussion regarding the use of instrumentation when an infection is active. According to certain research, titanium and stainless steel might have different biocompatibility properties, which could affect bacterial colonization and adhesion. Finding the best surgical strategy in situations where infection is present is made more difficult by the inconsistent results of research on this subject[4].

An important turning point occurred in the 1990s when internal fixation gained popularity in spinal infection reconstructive surgery, with many surgeons

reporting favorable results. Because it supports the healing process and restores spinal integrity, this development has improved patient recovery. The decision to use internal fixation should still be carefully considered, though, particularly in cases where an infection is actively present. [5].

For both infection healing and spinal mechanics, a stable anterior spinal column must be restored. In order to facilitate bone fusion and rebuild the spinal structure, bone grafting is essential in the surgical treatment of spondylodiscitis. Local bone grafting techniques, such as using the spinous process, have shown similar fusion rates and times as iliac bone struts but with reduced surgical time and fewer complications [6].

Aim of the work

The purpose of this study was to review the literature on spondylodiscitis diagnosis and treatment approaches. In order to evaluate the safety and efficacy of surgically treating spondylodiscitis, it also sought to evaluate the clinical and radiological results of combining posterior instrumentation with bone grafting.

Patients and Methods

From August 2021 to March 2024, 30 patients with spondylodiscitis were treated and monitored as part of this prospective study. For a minimum of six months, each patient was monitored. The Orthopaedic Surgery Departments of Shebin Elkom Neurosurgery Hospital and Al-Azhar University Hospital hosted the study. In accordance with the Declaration of Helsinki and other pertinent guidelines, the study was examined and approved by the ethical committee. Every participant provided their informed consent prior to enrollment, and their information was kept private. Withdrawing from the study at any time did not impact the participants' course of treatment.

Patients with a confirmed diagnosis of spondylodiscitis who also had one or more of the following conditions were included in the study: neurological deficits developing, persistent pain with high ESR/CRP levels, and lack of improvement after two to three weeks of treatment.; abscess formation; significant destruction of the vertebral endplates; or spinal deformity or instability. These criteria were selected to identify patients who were more likely to require surgical treatment due to the severity of their condition. Exclusion criteria included patients who improved clinically or in laboratory results with medical treatment, those with multiple distant level involvement identified on MRI, those who were unfit for surgery, or those with abscesses located anterior to the vertebral body, as these factors could complicate surgical outcomes or require alternative management strategies.

regarding preoperative evaluation Before surgery, all patients underwent a comprehensive evaluation. This included a complete history taking, which covered personal details, complaints, the onset, duration, and progression of symptoms, as well as previous treatments. Pain severity was assessed using the Visual Analog Scale (VAS), where 0 indicates no pain and 10 represents the worst possible pain. The Oswestry Disability Index was used to assess the degree of

functional disability due to back pain. A complete physical examination was performed, including general systemic checks and a thorough back examination (inspection, palpation, range of motion, and muscle spasm). Neurological evaluations were also carried out, which included sensory tests (pain, touch, temperature) and motor tests (muscle tone and strength), using the Medical Research Council scale. The Frankel scale was utilized to assess the neurological deficit preoperatively.

Numerous standard laboratory tests were performed as part of the study, including coagulation profiles, blood glucose levels, chest X-rays, ECGs, liver and kidney function assessments, and CBCs. Particular attention was paid to tracking inflammatory markers like WBC count, CRP, and ESR; elevated CRP and ESR levels were frequently seen in the patients, indicating an inflammatory response. Since it yielded the most accurate results for identifying complications like epidural abscesses and provided crucial guidance for managing patient treatment, MRI with contrast was the preferred diagnostic technique.

Under general anesthesia, the patient was put in a prone position for the procedure. Three days before the procedure, no antibiotics were administered. All procedures were performed using a posterior approach under fluoroscopic guidance. The MRI and X-ray results were used to calculate the number of fusion levels. Following a thorough debridement of infected and necrotic tissue during surgery, a large amount of antibiotic solution irrigation was performed. All patients underwent decompression and instrument-assisted interbody bone grafting. Gram staining, Ziehl-Neelsen, and specific fungal stains were obtained, as well as biopsy specimens for aerobic, anaerobic, fungal, and mycobacterial cultures. Careful notes were kept on the operation's duration, complications, and blood loss (as determined by suction volume).

Postoperative antibiotics were administered based on the results of culture tests, and the duration was typically around 6 weeks, guided by laboratory markers. Data on postoperative complications, ambulation, hospital stay, and any difficulties encountered during recovery were systematically recorded.

Following surgery, patients were evaluated every two months until the study's end, after which they were evaluated monthly for the first three months. During clinical follow-up, progress was tracked using the Frankel scale, VAS, and Oswestry Disability Index. WBC count, CRP, and ESR were among the laboratory tests that were examined at every follow-up appointment. Radiological assessments comprised X-rays (lateral and A-P views) within three days of surgery, as well as follow-up X-rays to assess sagittal alignment, infection resolution, implant-related complications, and bony fusion. CT scans were used when delayed fusion was visible on X-rays.

Statistical Analysis

SPSS 26.0 was used to process the data. For quantitative variables, descriptive statistics involved calculating means, standard deviations, and ranges; for qualitative variables, this involved calculating frequencies with percentages. Pearson correlation was utilized for multiple variables, t-tests/Mann-Whitney

tests were used for quantitative data, and chi-square and Fisher's exact tests were applied to qualitative variables. The p-value was deemed statistically significant if it was less than 0.05.

Results

In our series, the primary indication was the lack of improvement with medical treatment (9 patients) after 2-3 weeks of consistent therapy, marked by ongoing elevations in laboratory markers. Abscess formation was observed in 6 patients as a subsequent complication., severe persistent pain in 5 patients, neurological deficit in 4 patients, neurological deficit and deformity in 2 patients, endplate destruction and severe pain in 3 patients and one patients with unsure diagnosis but in the presence of destruction of end plate. **Table 1**

Table 1: Indications of surgery in our patients

Indications of surgery	*Number of patients (30 Patients)*	*%*
Refractoriness to medical management	9	30%
Abscess formation	6	20%
Severe persistent pain	5	16.7%
Neurological deficit	4	13.3%
Neurological deficit and deformity	2	6.7%
Endplate destruction and severe pain	3	10%
Unsure diagnosis and destruction of end plate	1	3.3%

Preoperatively, 20% of patients had elevated WBC counts, while CRP and ESR were elevated in all. The mean WBC count decreased from 9,200 ± 2,295.42 $\times 10^6$/L before surgery to 7,373.67 ± 2,098.04 $\times 10^6$/L postoperatively ($p < 0.001$). CRP dropped from 54.77 ± 16.86 mg/L to 4.00 ± 8.3 mg/L ($p < 0.001$), and ESR reduced from 84.63 ± 21.63 mm/hr to 9.23 ± 4.62 mm/hr ($p < 0.001$). Pain scores significantly improved, with Visual Analog Scale scores dropping from a range of 6-10 preoperatively to 1-5 postoperatively, with most patients reporting a score of 2 ($p < 0.001$). **Table 2**

Table 2: Outcome of the studied patients

Outcome of the Studied Patients	**Preoperative (N=30)**	**Postoperative (N=30)**	**p-value**
Laboratory Outcome			
WBCs ($\times 10^6$/L)	9,200 ± 2,295.42	7,373.67 ± 2,098.04	<0.001*
CRP (mg/L)	54.77 ± 16.86	4.00 ± 8.30	<0.001*
ESR (mm/hr)	84.63 ± 21.63	9.23 ± 4.62	<0.001*
Clinical Outcome (Visual Pain Analogue Scale)			
VAS = 0	0 (0%)	0 (0%)	<0.001*

Outcome of the Studied Patients	Preoperative (N=30)	Postoperative (N=30)	p-value
VAS = 1	0 (0%)	5 (16.67%)	
VAS = 2	0 (0%)	8 (26.67%)	
VAS = 3	0 (0%)	5 (16.67%)	
VAS = 4	0 (0%)	7 (23.33%)	
VAS = 5	0 (0%)	5 (16.67%)	
VAS = 6	8 (26.67%)	0 (0%)	
VAS = 7	6 (20%)	0 (0%)	
VAS = 8	7 (23.33%)	0 (0%)	
VAS = 9	4 (13.33%)	0 (0%)	
VAS = 10	5 (16.67%)	0 (0%)	

The patients in this study were followed up for an average of 7 ± 2 months, with a range of 6 to 10 months. In six patients (20%), complications developed. An intraoperative dural tear in one patient was managed by sutures without any further leakage. Using debridement, antibiotics, and frequent dressing changes, three patients experienced superficial wound infections. Two patients were asymptomatic despite having misaligned transpedicular screws. During the study period, no patients died, with the exception of one who died six months after surgery from chronic renal failure, which had been diagnosed six years prior.. (**Fig.1**)

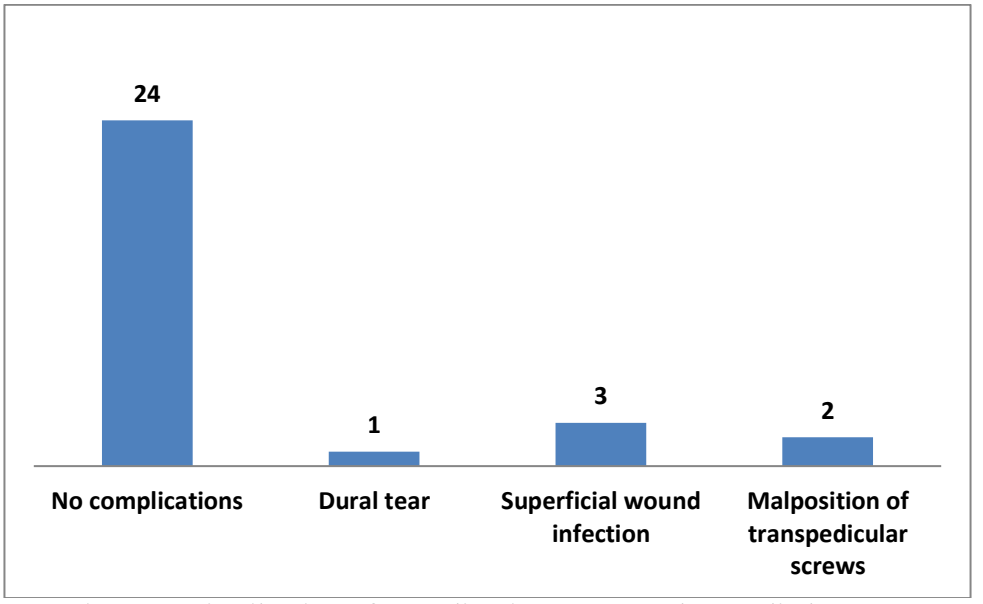


Figure1: Distribution of complications among the studied group.

Preoperatively, according to the ODI, 3 patients (10%) had no disability, 4 patients (13.33%) had mild disability, 9 patients (30%) had moderate disability, 10 patients (33.33%) had severe disability, and 4 patients (13.33%) were completely disabled. Postoperative results showed that 12 patients (40%) had no disability, 15 patients (50%) had mild disability, 3 patients (10%) had moderate disability,

and no patients had severe or complete disability. The difference was statistically significant (p < 0.001).**Table 3**

Table 3: the difference between the ODI preoperatively and postoperatively among the patients included in the study

Oswestry Disability Index	*Preoperative (N=30)*	*Postoperative (N=30)*	*p value*
No disability(0-4)	3 (10%)	12 (40%)	**<0.001 ^***
Mild Disability(5-14)	4 (13.33%)	15 (50%)	
Moderate Disability(15-24)	9 (0%)	3 (10%)	
Severe Disability(25-34)	10 (33.33%)	0 (0%)	
Completely Disabled(35-50)	4 (13.33%)	0 (0%)	

Data in N(%) ^ Pearson Correlation test

* Statistically significant at 95% level of confidence.

Preoperatively, 24 patients (80%) were Frankel E while 3 patients (10%) were Frankel A and another 3 patients (10%) were Frankel C. Postoperatively, only one patient (3.33%) remained Frankel D while two patients (6.66%) became Frankel C, and 27 patients (90%) were Frankel E. the difference was statistically significant ***(p <0.001)***. **Table 4**

Table 4: The Frankel scale before and after operative intervention in the patients included in the study

Frankel Scale	*Preoperative (N=30)*	*Postoperative (N=30)*	*p value*
A	3 (10%)	0 (0%)	**<0.001 ^***
B	0 (0%)	0 (0%)	
C	3 (10%)	2 (6.66%)	
D	0 (0%)	1 (3.33%)	
E	24 (80%)	27 (90%)	

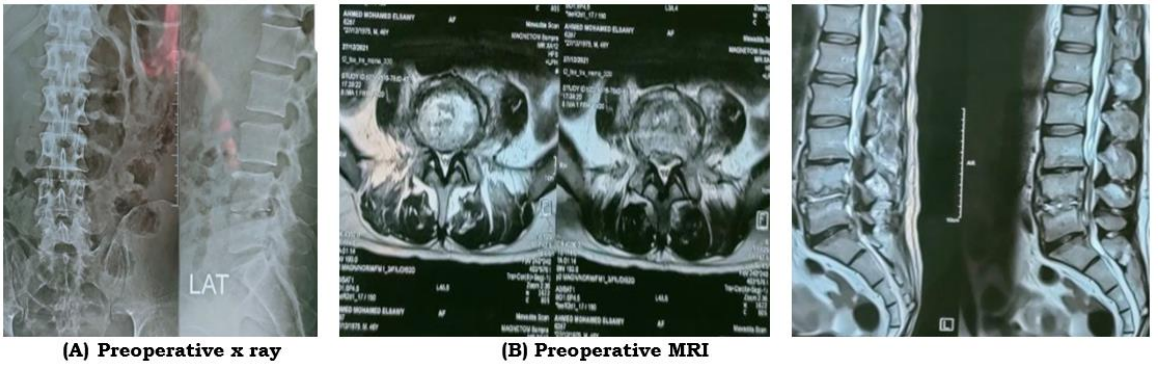
Data in N (%)

^ Pearson Correlation test

* Statistically significant at 95% level of confidence.

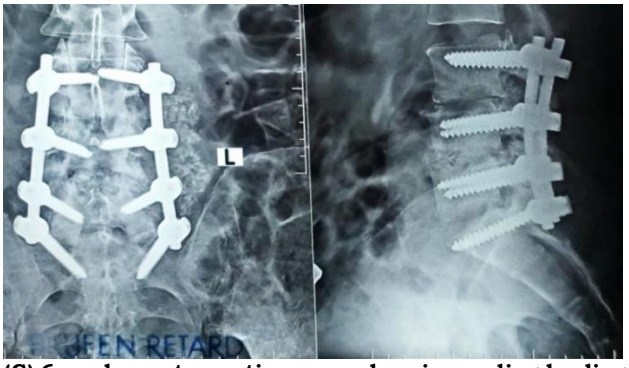
Cases

A 48-year-old male with spontaneous spondylodiscitis from L3 to S1 presented with severe back pain and bilateral sciatica. Initial assessments showed Frankel grade C, severe disability (ODI), and a VAS of 9. Postoperative recovery at 6 weeks included mild back pain, Frankel grade E, VAS of 4, and normal sphincteric control. Streptococcus was identified in cultures. By the end of follow-up, the patient showed full clinical improvement with a VAS of 1, Frankel grade E, no disability, and normalized lab values. X-rays confirmed complete healing and fusion.

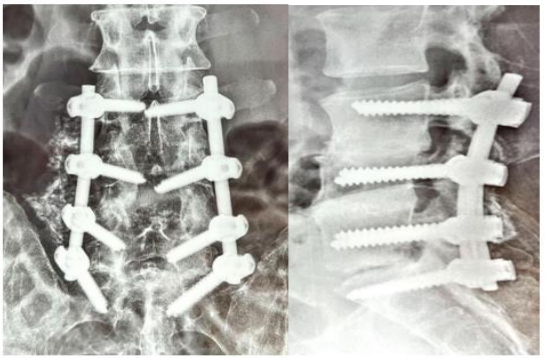


(A) Preoperative x ray **(B) Preoperative MRI**

Fig 2. (A)Preoperative x ray and (B)Preoperative MRI

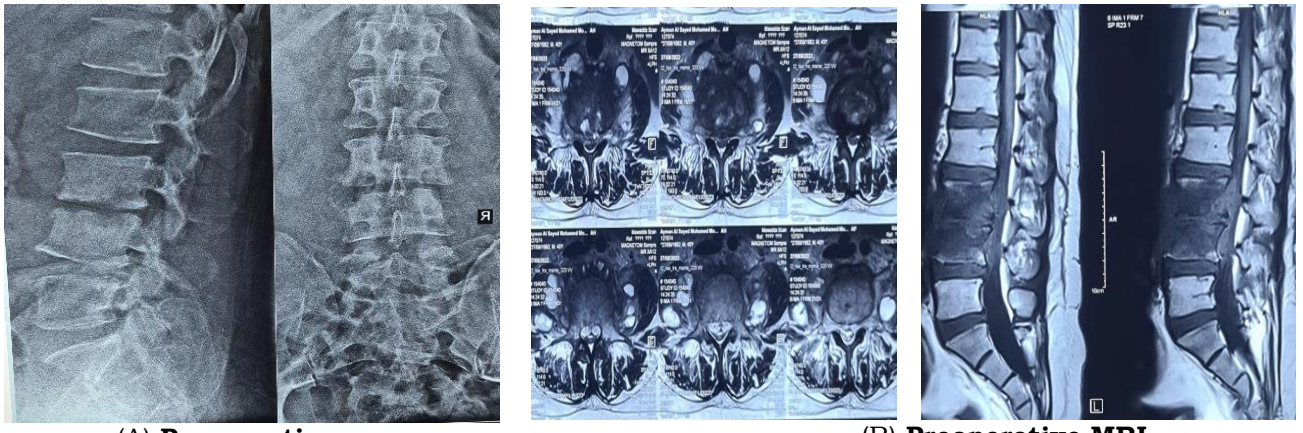


(C) 6 weeks postoperative x ray show impending healing



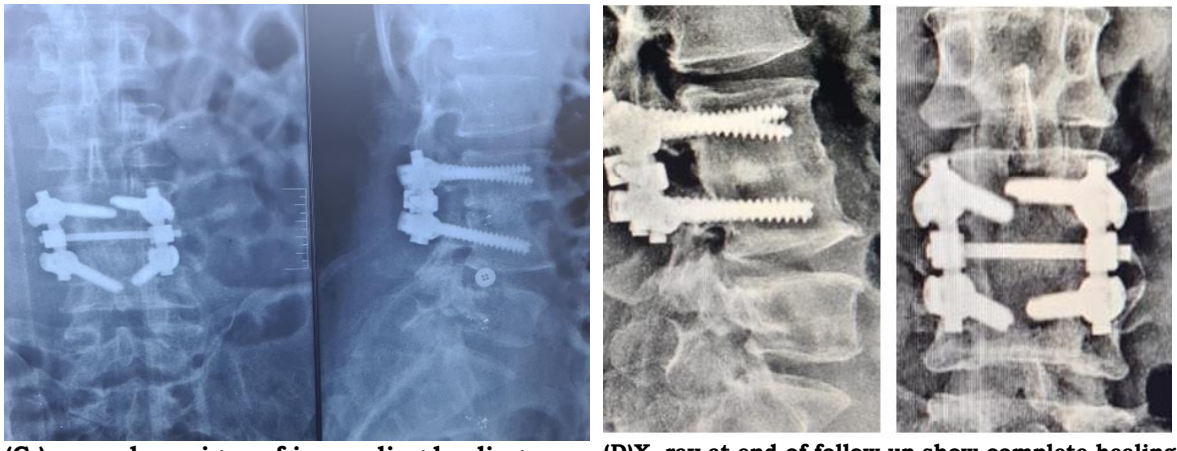
(D) x-ray show full healing and fusion

Case 2 is a 58-year-old male with L3-L4 spondylodiscitis, presenting with severe low back pain and bilateral sciatica. Initial assessments showed significant neurological impairment (Frankel grade C), severe disability (ODI), and high pain levels (VAS 9). Lab results confirmed active infection (elevated TLC, CRP, ESR). Preoperative X-ray and MRI showed structural damage. Six weeks post-op, the patient reported mild back pain with no sciatica (Frankel grade D, VAS 4, mild ODI), and lab results improved. Staphylococcus aureus was identified as the infecting organism. At follow-up, the patient had no pain or sciatica, with full recovery (Frankel grade E, VAS 2, no disability) and continued improvement in lab results, indicating successful treatment.



(A) **Preoperative x-ray** (B) **Preoperative MRI**

Fig.4(A)Preoperative x ray and (B)Preoperative MRI



(C)x-ray show signs of impending healing **(D)X- ray at end of follow up show complete healing and fusion**

Fig 5. (C) 6 weeks postoperative X-ray showing signs of impending healing. (D) X-ray showing full healing and fusion

Discussion

Before the 1990s, radical debridement combined with autogenous strut-graft fusion and antibiotics was the standard treatment for pyogenic spinal infections, with little to no surgical instrumentation. Until surgical developments started to change treatment approaches, this approach was widely used. when internal fixation began to be accepted. Some recommend external bracing over instrumentation, while others advocate staged procedures with debridement followed by antibiotics and instrumentation. Non-instrumented surgery can lead to complications like loss of correction. Instrumentation now offers benefits like better sagittal balance, higher fusion rates, and no donor site morbidity. Anterior debridement remains the gold standard for vertebral osteomyelitis, and the study focused on evaluating spinal instrumentation in managing spondylodiscitis [18-19].

Thirty spondylodiscitis patients in all underwent posterior instrumentation with interbody grafting as part of our study. Of them, nine (30%) were female and 21 (70%) were male, As a result, the ratio of males to females was 2.3 to 1.

In our study, the inclusion criteria were determined by the patients' pathology, clinical presentation, and previous treatment responses. The most common factors were refractoriness to medical management (30%), abscess formation (20%), severe pain (16.7%), neurological deficits (13.3%), and multiple indications (20%) like endplate destruction and spinal deformity. These criteria are consistent with those of Cardoso et al., Amini et al., and Mavrogenis et al.[7-8-10], and align with the treatment indications reported by Herren et al., which were centered around pain, treatment failure, vertebral destruction, and severe abscess formation[9].

The majority of patients (96.7%) reported experiencing severe back pain, with 34 patients (56.7%) presenting with a high preoperative VAS score of 9 or 10. This reflects the subjective nature of pain, which can vary greatly between individuals. The anterior or posterior cortical margins were affected in 25 patients (41.7%) who had vertebral body destruction. Additionally, 16 patients (26.7%) had neurological deficits, including lower extremity weakness or sensory abnormalities, underscoring the severity of the illness and its effects on peripheral nerves as well as the spinal cord.

The study involved 30 patients who underwent treatment using a posterior approach, including Transforaminal Lumbar Interbody bone grafting and posterior instrumentation. This approach was similar to the method used by Tammam and Said, who emphasized the necessity of direct access to the infection site for aggressive debridement[11]. Hosameldin et al. combined anterior debridement with posterior instrumentation for non-tuberculous spondylodiscitis[12]. Although we understand the potential benefits of anterior and combined approaches, our study concentrated on the posterior technique due to the limitations of the research scope.

The follow-up period in our study was between 6 and 10 months, with a mean of 7 ± 2 months. Mavrogenis et al. had a much longer follow-up, ranging from 3 to 54 months with an average of 21.1 months[7]. Amini's research had a mean follow-up of 35.8 months, with a range of 26 to 50 months[10]. On the other hand, Herren et al. had a shorter follow-up period, averaging 10.9 months, with a range of 6 to 24 months[9]. Cardoso et al. required a minimum follow-up of two years, with an average of 32.9 months and a range of 24 to 48 months. Tammam and Said's study had an average follow-up of 11.16 months, with a range of 6 to 64 months[11]. These differences in follow-up times illustrate the varying study designs and patient populations.

In our series, the complication rate was 20% (6 cases). The complications included one intraoperative dural tear (3.3%) managed with suturing, three cases (10%) of superficial wound infections treated with debridement, daily dressing, and antibiotics, and two cases (6.7%) of malpositioned transpedicular screws, which were asymptomatic and for which the patients declined reoperation. Due to insufficient follow-up duration, relapse rates were not accurately determined,

although infection recurrence is known to happen even years after treatment. In a study with a follow-up of 6.5 years, relapse occurred in 14% of cases, with most relapses occurring within the first year. In comparison, similar complications have been reported in other studies, such as those by Cardoso et al., who documented graft dislodgement and persistent fungal infections[8], and Mavrogenis et al., where 21% of patients had complications, including one death from acute respiratory distress syndrome[7].

When comparing complication rates across studies, our findings were in line with those of Cardoso et al. (20%), not quite as high as the 21% Mavrogenis et al.[7] reported, but higher than Tammam's study, which reported 6.7%[11]. A correlation was observed between hematogenous infection spread and higher complication rates in our series, with all complications occurring in patients with hematogenous infections. Mortality was primarily linked to preoperative systemic diseases rather than the surgery itself. Notably, one patient in our series died from chronic renal failure six months post-surgery. Other studies, including Cardoso et al.[8] and Mavrogenis et al.[7], also showed that deaths were unrelated to surgery or infection. Infection rates following spinal instrumentation in these studies ranged from 0 to 9.7%, which aligns with our findings. Although infection recurrence was similar in both instrumentation and conservative fusion surgeries, the higher revision and mortality rates in the instrumentation group may be attributed to the complexity of the procedures.

All of the patients in our study had elevated CRP and ESR levels, and 20% of the patients had elevated preoperative WBC counts. But by the end of the follow-up, all markers had significantly improved ($p < 0.001$). By contrast, Cardoso et al. discovered that 53% of patients had an elevated preoperative WBC count, 79% had an elevated CRP, and 100% had an elevated ESR. After surgery, the average WBC, CRP, and ESR levels dropped from 10,332/µL to 7,694/µL, 53.48 mg/L to 17.76 mg/L, and 64.05 mm/hr to 31.78 mm/hr, respectively[8].

Within six months following surgery, WBC, CRP, and ESR levels were normal again, according to both our results and those of Mavrogenis et al[7]. All patients had successful infection control, according to Tammam et al., and laboratory markers returned to normal after an average of 4.8 months (2 to 6 months)[11]. Similarly, Su et al., (2021)[17] stated that, at the last follow-up, ESR and CRP returned to normal for all patients.

In our study, functional assessment was performed using the Oswestry Disability Index (ODI), which is a widely recognized tool for evaluating disability related to spinal conditions. This approach aligns with Cardoso and colleagues[8], who also used the ODI in their study. Similarly, Rezvani et al., (2024)[16]who used Oswestry disability index scores and found that, 44.6 % of the patients had mild or no functional disabilities. In contrast, Mavrogenis and others employed the modified MacNab criteria[7], a different method that focuses more on clinical outcomes like pain relief and functional recovery. Herren and colleagues[9], however, did not specify a particular scale for functional assessment, which may limit the ability to directly compare their results with those using standardized tools like the ODI or MacNab criteria. The choice of assessment tool reflects differing approaches to evaluating outcomes, with the ODI providing a more detailed disability-focused

evaluation, while other methods may focus more on pain and overall functional improvement.

Before surgery, 80% of the patients in our study (24 out of 30) were classified as Frankel E, 10% as Frankel type A (3 patients), and 10% as Frankel type C. Five patients had neurological improvement after surgery; four of them had two-grade improvement and one had one-grade improvement on the Frankel scale. The sole patient who did not get better had previously had a laminectomy without fixation, which caused the vertebral body to collapse completely and resulted in a severe kyphotic deformity. A significant neurological recovery that is in line with our findings was demonstrated by Mavrogenis et al., who reported a preoperative mean Frankel score of 3.78 ± 0.70 that increased to 4.78 ± 0.35 at the last check-up. [7]. Our research emphasizes how important the preoperative neurological state is in determining the postoperative outcome for spondylodiscitis, which is consistent with the majority of other studies in the field.

Similar to Mavrogenis et al., we used the Frankel classification to assess neurological function both before surgery and at the conclusion of the follow-up period[7]. The Visual Analogue Scale (VAS), which was also employed in Tammam et al.'sstudy,was used to measure the intensity of pain at both time points[11]. In our study, the mean Visual Analog Scale (VAS) score ranged from 6 to 10 before surgery and from 1 to 5 at the end of the follow-up period, with a highly significant p-value (<0.001), indicating Significant pain relief was demonstrated by our study's mean VAS score, which dropped from 6–10 preoperatively to 1–5 at follow-up ($p < 0.001$). This outcome is consistent with the study by Tammam et al., in which the VAS score decreased from 7.43±0.54 to 2.07±1.12[11]. Using the modified MacNab criteria, Mavrogenis et al. discovered that 12.5% of patients had mild, non-disruptive pain and 87.5% were pain-free [7]. Despite using different assessment instruments, the overall pain reduction seen in our study is consistent with the favorable results in Tammam's and Mavrogenis' studies. Additionally, Endres et al. (2012)[15] reported that 5 postoperative patients had no pain or used analgesics only occasionally, with VAS scores ranging from 0 to 20. The remaining 2 patients experienced residual symptoms and required regular peripheral pain medication and opiates, with their VAS scores ranging from 30 to 50.15

All radiographs in our study showed resolution of infection, with no complications related to the instrumentation, such as graft expulsion, migration of screws, or pullout. There was no recurrence of infection or secondary infections due to spinal instrumentation. Adequate fusion was confirmed in all patients, marked by bone trabeculae in the graft site, and significant improvement in sagittal alignment compared to their preoperative imaging. Tammam et al. achieved successful interbody bony fusion in all patients except one who died due to complications from miliary tuberculosis[11]. Cardoso et al. also reported graft incorporation and bony fusion in all patients, with no issues with infection or hardware failure[8]. The kyphotic angle improved by 12.7° postoperatively, and slightly decreased to 10.7° after two years, showing only minor loss. Natarajan et al. underlined the importance of posterior stabilization for achieving these positive outcomes, reinforcing the results found in Tammam’s and Cardoso’s studies,

where grafting and instrumentation were essential for successful fusion and favorable results[14].

Conclusion

Although conservative treatment is usually effective for early-stage spondylodiscitis, instrumented surgery may be helpful for pain management, sagittal balance restoration, neurologic function improvement, and early ambulation. In some patients, our research confirms that posterior instrumentation with interbody grafting after thorough debridement is a safe and efficient treatment for lumbar spondylodiscitis. Complete debridement guarantees that the equipment won't encourage the infection to persist or recur, nor will it necessitate prolonged hospital stays or antibiotic therapy. Further prospective research and multicenter partnerships are required to confirm these results.

Consent for Publication

- All authors have agreed to the content of the manuscript.
- I am privileged to represent all authors in communicating with your journal and hope that our research receives your thoughtful consideration.

Availability of Data and Materials

- The data is available upon request.

Competing Interests

- The authors declare no conflicts of interest in relation to this paper.
- This research was conducted without any external funding.

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