

SURGICAL STABILIZATION FOR POST-OPERATIVE DISCITIS PATIENTS CONCERNING PAIN RELIEF AND FUNCTIONAL OUTCOMES

Abdul Sattar¹, Samir Khan Kabir², Muhammad Zahid Khan³, Muhammad Waqar Khan⁴, Muhammad Arif Khan⁵

Correspondence

²Samir Khan Kabir, Assistant Professor, Orthopedic & Spine Unit, Hayatabad Medical Complex, Peshawar

☎: +92-300-8596400

✉: skkabir@gmail.com

¹Associate Professor, Orthopedic & Spine Unit, Hayatabad Medical Complex, Peshawar

³Assistant Professor, Orthopedic & Spine Unit, Hayatabad Medical Complex, Peshawar

⁴SPR Spine, Hayatabad Medical Complex, Peshawar

⁵Professor, Orthopedic & Spine Unit, Hayatabad Medical Complex, Peshawar

How to cite this article

Sattar A, Kabir SK, Khan MZ, Khan MW, Khan MA. Surgical Stabilization for Post-Operative Discitis Patients Concerning Pain Relief and Functional Outcomes. J Gandhara Med Dent Sci. 2023;10(4):45-48
<https://doi.org/10.37762/jgm.10-4.538>

ABSTRACT

OBJECTIVES

This study evaluated pain relief and functional outcomes in patients who underwent surgical stabilization following post-operative discitis.

METHODOLOGY

A cross-sectional was conducted at the Department of Orthopedic and Spine Surgery, Peshawar. The study duration spanned from 2020-2023. The inclusion criteria for participants involved patients who had experienced post-operative discitis and subsequently underwent surgical stabilization, with a stipulated minimum follow-up period of two weeks. Pain relief was measured using the Visual Analogue Score (VAS) for back and leg pain, while functional outcomes were evaluated using the Oswestry Disability Index (ODI). The acquired data were subjected to analysis utilizing SPSS version 26.0.

RESULTS

Out of the 35, 51.4% were male, and 48.6% were female, with a mean age of 47.5 years (SD ± 10.9 years). The most frequently affected lumbar spine level was L4-L5 in 57.1% of patients. 31.4% were smokers, and 45.7% had comorbidities, primarily consisting of diabetes or hypertension. Significant improvements were observed for back pain (baseline: 9.29 ± 0.71, post-stabilization: 5.37 ± 1.47, p = 0.001) and leg pain (baseline: 3.32 ± 2.17, post-stabilization: 1.91 ± 1.02, p = 0.001). Functional outcomes also showed substantial recovery (baseline: 51.57 ± 6.91, post-stabilization: 34.89 ± 6.85, p = 0.001). Preoperatively, the patients exhibited a spectrum of disability levels, with 29% experiencing severe disability. After two weeks of surgical intervention, substantial improvement was noted, 6% had severe disability. At the last follow-up, only 1% remained severely disabled, underlining the significant enhancement in functional outcomes post-stabilization.

CONCLUSION

Surgical stabilization is associated with significant pain relief and improved functional outcomes in patients with post-operative discitis.

KEYWORDS: Discitis, Disability, Pain, Surgery

INTRODUCTION

Post-operative discitis, a potentially debilitating condition characterized by infection and inflammation of the intervertebral discs following spinal surgery, presents a considerable clinical challenge for patients and healthcare providers.¹ Despite advances in surgical techniques and perioperative care, post-operative discitis remains an unfortunate complication that can lead to persistent pain, functional impairment, and prolonged hospitalization.² The intricate interplay of factors contributing to this condition, such as introducing foreign materials during surgery and the risk of bacterial colonization, underscores the need for a comprehensive understanding of its management and outcomes. Post-operative infection in any field is a drastic complication for patients and doctors. In spine surgery, it is a rare complication but poses great and poses a great challenge for the treatment as any other

bone infection. The reported incidence may vary greatly but usually remains around 1% although local studies reported comparatively high incidence, 4.4% and 15%, respectively.³ Prevention by adopting all aseptic measures should be the priority of any surgeon to prevent post-operative infection. Thorough patient examination and optimization of any comorbidities, if possible, especially diabetes, which is extremely prevalent these days.^{4,5} The next focus should be early diagnosis of post-operative infection. The severe back pain not relieved with routine analgesics and not improved with rest should arouse suspicion of infection in the post-operative period. Fever is not a reliable parameter in this regard. Early inflammatory markers are recommended, and prompt antibiotic coverage should be provided. One should not rely on inflammatory markers only as they may not be specific for infection in the early post-operative period due to ongoing inflammation due to surgical trauma.⁶ If there

is any doubt, early MRI scanning is recommended.⁷ Typical MRI findings are hypo intense signal on T1 weighted images and hyperintense on T2 arising from disc and bodies with loss of endplate contour and enhancement on post-contrast studies. There may also be the formation of abscess in adjustment soft tissues and epidural space.⁸ Post-operative discitis poses a significant burden on affected individuals and healthcare systems. Patients often experience excruciating pain, requiring prolonged hospital stays, repeated surgeries, and intensive antibiotic therapy.^{9,10} The impact on patients quality of life, productivity, and overall well-being is profound. Investigating surgical stabilization as a potential solution for pain relief and functional improvement is of paramount clinical importance. Despite the clinical relevance of post-operative discitis, there is a notable paucity of comprehensive studies examining the outcomes of surgical stabilization in this context. Existing research often focuses on diagnostic and medical management aspects, leaving a critical knowledge gap regarding the surgical interventions effectiveness. This study seeks to address this gap by providing valuable insights into the outcomes associated with surgical stabilization. This study aims to investigate the efficacy of surgical stabilization as a treatment modality for post-operative discitis, with a primary focus on assessing pain relief and functional outcomes.

METHODOLOGY

A prospective cross-sectional study was conducted at the Department of Orthopaedic and Spine Surgery, Khyber Girls Medical College, Peshawar, from 2020-2023. Baseline assessments were conducted, encompassing crucial parameters. The efficacy of interventions was gauged using established measures, including the Visual Analogue Score (VAS) to quantify pain relief for both back and leg regions and the Oswestry Disability Index (ODI) to assess functional outcomes. The patients included in this study had post-operative discitis, accompanied by a subsequent surgical stabilization procedure and a minimum follow-up period of two weeks. Individuals with a history of previous instrumented spine surgery, tuberculous spondylitis, spontaneous spondylitis, or vertebral osteomyelitis were excluded from the study. Rigorous adherence to ethical guidelines was maintained, as all patients who underwent spine stabilization after post-operative discitis were granted informed consent for their participation. The collected data underwent statistical analysis utilizing SPSS version 26.0.

RESULTS

A total of 35 patients fulfilled the study’s criteria and

were included. Out of 35 patients 18(51.4%) were male and 17(48.6%) were female. The mean age of the group was 47.5 years (SD 10.9 years). The most common level involved was L4-L5 with 20(57.1%) patients, 13 patients (37.1%) have L5-S1, while in 2(5.7%) patients L3-L4 were involved.

Table 1: Baseline Characteristics of Study Participants

		N	%age
Level of Lumbar Spine	L5-S1	13	37.1%
	L4-L5	20	57.1%
	L3-L4	02	5.7%
Smoking	No	24	68.6%
	Yes	11	31.4%
History of Comorbidity	No Comorbidity	16	45.7%
	Diabetic/ Hypertension	19	8.6%

Table 2: Pain Relief Assessment using Visual Analogue Score (VAS)

Pain Assessment	Baseline	Post-Stabilization	t-test	df	P-Value	Mean Difference (95% CI)
Back Pain (VAS)	9.29±0.71	5.37±1.47	14.206	68	0.001	3.92 (3.36-4.47)
Leg Pain (VAS)	3.32±2.17	1.91±1.02	3.478	68	0.001	1.41 (0.60-2.21)

Table 3: Functional Outcomes using the Oswestry Disability Index (ODI)

Functional Assessment	Baseline	Post-Stabilization	t-test	df	P-Value	Mean Difference (95% CI)
ODI Score	51.57±6.91	34.89±6.85	10.142	68	0.001	16.68 (13.39-19.96)

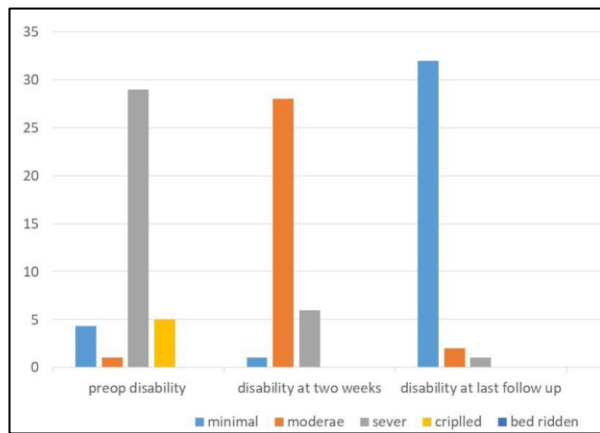


Figure 1: Showing the Disability of the Patients

DISCUSSION

Rest analgesia and immobilization in functional position are historically used in treating bone and joint infections to promote arthrodesis and pain relief. Surgical stabilization and fusion in infection are not

new in spine surgery. The first fusion was performed for infection tuberculous spondylitis by Hibbs in 1911. It was not debridement and drainage but posterior stabilization for thoracic tuberculous spondylitis.^{11,12} It is believed that apart from providing stability to the spine and relieving pain caused by instability due to infection, stabilization also improves infection healing. At the same time, it provides the opportunity to remove dead avascular tissue, decompress neural elements and obtain tissue for specific diagnosis and antibiotic sensitivity.¹³ Prevention of surgical site infection is of paramount importance. Preoperative selection of patients is very important. Every effort should be made to plan surgical intervention carefully. Focus carefully should be made to diagnose and modify any comorbid condition whenever possible.¹⁴ The operation theatre routine patients shifting trafficking and overall theatre culture is very important. Adopting a local strategy in the form of an infection prevention bundle devised by individual centres can give a paramount reduction in postop infection surgical technique, and damaging endplates in the desire to complete disc removal is also reported to be the cause of discitis.¹⁵ Our study affected Patients of both genders almost equally, so it is not a risk factor for developing discitis. Our group's most prevalent risk factors were old age, smoking, and comorbidities. Like our result, other researchers reported old age, failed spinal surgery and Diabetes as risk factors for spinal infection and poor outcomes after surgery.¹⁶ All our patients reported severe back pain as the prime cause of concern. Leg pain was uncommon; in most cases, there was thigh pain and Rutherford radicular pain. Most of the studies reported similar results.¹⁷ Inflammatory markers elevation is extremely important in the diagnosis of post-operative discitis. However, one should remember that changes in these parameters can sometimes occur due to surgical trauma without infection.¹⁸ This is why everything should be assessed in conjunction, and severe back pain should alert one for post-operative discitis. Sometimes, clinical symptoms may be masked using antibiotics. One should get an early MRI whenever there is the slightest suspicion of discitis.¹⁹ Serial inflammatory markers are important, although ESR takes longer to return to normal. Inflammatory markers remain high even after clinical improvement in the early post-operative period.²⁰ A study reported a trend in 2012, treating 4 patients with surgical stabilization posteriorly out of 17 patients with post-operative discitis.²¹ They emphasized early detection and aggressive antibiotic treatment for successful conservative treatment. Similarly, in their study, Ahsan K et al. reported success with early intravenous antibiotics for treating post-operative discitis in 55 patients out of 75.¹³ After 4 weeks, if there was no response, they underwent surgical intervention.

They reported a 90% satisfaction rate for early surgical treatment against 76% with conservative treatment. Similar successful results after early aggressive IV antibiotic treatment were reported by Sharma R et al. Every effort should be made to prevent post-operative discitis by carefully planning a surgery, selecting patients, and adopting proper operation theatre protocol and safe surgical technique.²² One should focus on Careful soft tissue dissection, avoiding ischemia due to retractors. Haemostasis should be properly secured, and frequent washing with saline should be done. While removing the disc, damage to the end plate should be avoided. Every focus should be placed on early detection of discitis getting an MRI as early as possible in any suspected case.

LIMITATIONS

The relatively small sample size of 35 patients from a single medical centre may affect the generalizability of the findings to a broader population. The absence of a control group or comparison with alternative treatment modalities hinders the ability to definitively establish the superiority of surgical stabilization in managing post-operative discitis.

CONCLUSIONS

This cross-sectional study demonstrates that surgical stabilization is associated with significant pain relief and improved functional outcomes in patients with post-operative discitis. The reduction in pain intensity, as measured by VAS, and the enhancement in functional capacity, as indicated by ODI scores, underscore the effectiveness of surgical intervention in managing this condition. These findings contribute to the existing body of knowledge and highlight the importance of considering surgical stabilization as a viable treatment option for post-operative discitis. Further prospective studies are warranted to validate and expand upon these findings.

CONFLICT OF INTEREST: None

FUNDING SOURCES: None

REFERENCES

1. Chang C-W, Tsai T-T, Niu C-C, Fu T-S, Lai P-L, Chen L-H, et al. Transforaminal Interbody Debridement and Fusion to Manage Postdiscectomy Discitis in Lumbar Spine. *World Neurosurgery*. 2019 Jan;121:e755-60.
2. Nawaz Khan M, Ali Noman M, Ur-Rehman R-, Ullah S, Nasir A, Ayub S. Frequency of Discitis in Lumbar Discectomy Patients: A Two Year Study. *Pakistan Journal Of Neurological Surgery* [Internet]. 2019 Dec 29;23(4).

3. Nawaz Khan M, Ali Noman M, Ur-Rehman R-, Ullah S, Nasir A, Ayub S. Frequency of Discitis in Lumbar Discectomy Patients: A Two Year Study. Pakistan Journal Of Neurological Surgery [Internet]. 2019 Dec 29;23(4).
4. Shrestha RC, Sharma GR, Bhattachan M, Aryal S. Outcome of micro-lumbar discectomy and preventive measures to control discitis. Nepal Journal of Neuroscience. 2020 Apr 7;17(1):32–5.
5. MuhammedSaeed S, Snear Dri R. Outcome of back pain and radiculopathy in patients with single level lumbar discectomy. Diyala Journal of Medicine. 2022 Apr 5;24(1):14–23.
6. Zarghooni K, Röllinghoff M, Sobottke R, Eysel P. Treatment of spondylodiscitis. International orthopaedics. 2012 Feb;36(2):405–11.
7. Yates M, Shastri-Hurst N. The Oswestry Disability Index. Occupational Medicine. 2017 Mar 30;67(3):241–2.
8. Soffin EM, Freeman C, Hughes AP, Wetmore DS, Memtsoudis SG, Girardi FP, et al. Effects of a multimodal analgesic pathway with transversus abdominis plane block for lumbar spine fusion: a prospective feasibility trial. European Spine Journal. 2019 Jul 27;28(9):2077–86.
9. Tsantes AG, Papadopoulos DV, Vrioni G, Sioutis S, Sapkas G, Benzakour A, et al. Spinal Infections: An Update. Microorganisms. 2020 Mar 27;8(4):476.
10. Spina NT, Aleem IS, Nassr A, Lawrence BD. Surgical Site Infections in Spine Surgery: Preoperative Prevention Strategies to Minimize Risk. Global spine journal. 2018 Dec;8(4 Suppl):31S-36S.
11. Featherall J, Miller JA, Bennett EE, Lubelski D, Wang H, Khalaf T, et al. Implementation of an Infection Prevention Bundle to Reduce Surgical Site Infections and Cost Following Spine Surgery. JAMA Surgery. 2016 Oct 1;151(10):988.
12. Yousef AH, El-Sherif AM, Barakat YA. Role of Surgery in Management of Discitis. The Egyptian Journal of Hospital Medicine. 2018 Jul 1;72(11):5666–72.
13. Ahsan MK, Hasan MS, Khan MSI, Sakeb N. Management of post-operative discitis following discectomy in a tertiary-level hospital. Journal of Orthopaedic Surgery. 2021 Jan 1;29(1):230949902098821.
14. Singh DK, Singh N, Das PK, Malviya D. Management of Postoperative Discitis: A Review of 31 Patients. Asian journal of neurosurgery. 2018/Jul-Sep;13(3):703–6.
15. Jain M, Sahu RN, Gantaguru A, Das SS, Tripathy SK, Pattnaik A. Postoperative Lumbar Pyogenic Spondylodiscitis: An Institutional Review. Journal of neurosciences in rural practice. 2019 Jul;10(3):511–8.
16. Kim S-J, Lee SH, Chung HW, Lee MH, Shin MJ, Park SW. Magnetic Resonance Imaging Patterns of Post-Operative Spinal Infection: Relationship between the Clinical Onset of Infection and the Infection Site. Journal of Korean Neurosurgical Society. 2017 Jul;60(4):448–55.
17. Pilkington K. 6 week post operative outcomes following an accelerated recovery programme for lumbar spine discectomy and fusion procedures. Physiotherapy. 2020 May;107:e83.
18. Farag AA, Mahmoud B, Hammad W, Khoudir MA, A Sukkar F. Spinal Instrumentation in Spondylodiscitis: An Experience from Saudi Arabia. Journal of Spine Research and Surgery [Internet]. 2020;02(04).
19. AlShazli ABAD, Amer AY, Sultan AM, Barakat AS, Koptan W, ElMiligui Y, et al. Minimally Invasive Transforaminal Lumbar Interbody Fusion for the Surgical Management of Post-Discectomy Syndrome. Asian spine journal. 2020 Apr;14(2):148–56.
20. Ahsan MK, Hasan MS, Khan MSI, Sakeb N. Management of post-operative discitis following discectomy in a tertiary-level hospital. Journal of Orthopaedic Surgery. 2021 Jan 1;29(1):230949902098821.
21. Sharma R, Basit MA, Zaid F. Incidence of discitis in endoscopic spine surgery. International journal of health sciences. 2022 May 31;10248–53.
22. Open Transforaminal Lumbar Interbody Fusion (TLIF) for post-discectomy spondylodiscitis: Our experience. IP Indian Journal of Neurosciences. 2020 Dec 15;4(3):144–9.

CONTRIBUTORS

1. **Abdul Sattar** - Concept & Design; Data Acquisition; Data Analysis/Interpretation; Drafting Manuscript; Critical Revision; Supervision; Final Approval
2. **Samir Khan Kabir** - Concept & Design; Data Acquisition; Data Analysis/Interpretation; Drafting Manuscript; Critical Revision; Supervision; Final Approval
3. **Muhammad Zahid Khan** - Supervision; Final Approval
4. **Muhammad Waqar Khan** - Drafting Manuscript; Final Approval
5. **Muhammad Arif Khan** - Final Approval



LICENSE: JGMDS publishes its articles under a Creative Commons Attribution Non-Commercial Share-Alike license (CC-BY-NC-SA 4.0).

COPYRIGHTS: Authors retain the rights without any restrictions to freely download, print, share and disseminate the article for any lawful purpose.

It includes scholarly networks such as Research Gate, Google Scholar, LinkedIn, Academia.edu, Twitter, and other academic or professional networking sites.