

A Prospective Analysis of Dural Tears Among Patients of Lumber Spine Surgery at a Tertiary Care Hospital

Vijay Kumar Dahiya¹, Simple Chahar²

¹MBBS, MS (Orthopaedics), Fellow Spine Surgery, Central Institute of Orthopaedics, VMMC and Safdarjung Hospital, Delhi, India.

²Senior Resident, Department of Anesthesiology, Maulana Azad Medical College & Lok Nayak Hospital, Delhi, India.

ABSTRACT

Background: Incidental dural tear (DT) is a frequent intraoperative complication of spine surgery. The present prospective study was conducted to assess dural Tears among patients of Lumber Spine Surgery.

Materials and Methods: This is a prospective study to assess dural tears among patients of Lumber Spine Surgery. 200 patients with different types of decompressive and reconstructive procedure in the lumber region were selected for the study. Basic demographic information was recorded and compared between patients who had intra operative dural tear and patients who do not have a dural tear (controls). The length of surgery (minutes), estimated blood loss during surgery (ml) and amount of drainage (ml) were also recorded and compared the data between the two groups. The statistical significance was evaluated using Chi-squared test with value of $p=0.05$.

Results: This is a prospective study of 200 patients with different types of decompressive and reconstructive procedure in the lumber region. 15 patients (7.5%) were of dural tear. In level 1 total patients were 102 in which 9 were instrumented and 93 were non instrumented. In level 1 total patients with dural tear were 4 in which 3 patients were instrumented and 1 was non instrumented. In level 2 total patients were 68 in which 14 were instrumented and 54 were non instrumented. In level 2 total patients with dural tear were 4 in which 3 patients

were instrumented and 1 was non instrumented. In level >3 total patients were 30 in which 30 were instrumented. In level >3 total patients with dural tear were 7 in which 7 patients were instrumented. Mean duration of symptoms, mean time of surgery, complications were more in DT group.

Conclusion: The present study concluded that Postoperative complications were more, and outcome was poor in DT group in comparison to non DT group.

Keywords: Dural Tears, Lumber Spine Surgery, Intraoperative Complication.


*Correspondence to:

Dr. Simple Chahar,
Senior Resident,
Department of Anesthesiology,
Maulana Azad Medical College & Lok Nayak Hospital,
Delhi, India.

Article History:

Received: 25-09-2019, **Revised:** 19-10-2019, **Accepted:** 12-11-2019

Access this article online

Website: www.ijmrp.com	Quick Response code 
DOI: 10.21276/ijmrp.2019.5.6.054	

INTRODUCTION

Incidental dural tear (DT) is a frequent intraoperative complication of spine surgery. The reported incidence of DT for all spine surgeries is 1.6–10%.¹⁻⁶ Additional studies showed a higher percentage of lumbar dural tears in revision spine surgeries, ranging from 2.1% to 15.9%,^{4,8-10} with a significant association between unintended durotomy and development of a new neurological deficit.¹¹ DTs that cannot be closed, those that are not adequately closed, or those that are unrecognized may result in relevant cerebrospinal fluid leakage, which may cause postural headaches, vertigo, posterior neck pain, neck and/or stiffness, nausea, diplopia, photophobia, tinnitus, and blurred vision.¹¹⁻¹³ The present prospective study was conducted to assess dural Tears among patients of Lumber Spine Surgery.

MATERIALS AND METHODS

This is a prospective study to assess dural tears among patients of Lumber Spine Surgery. Written informed consent was taken from the patients. 200 patients with different types of decompressive and reconstructive procedure in the lumber region were selected for the study. Patients treated for tumor, trauma, infection and deformity were excluded from the study. Basic demographic information including age, sex, body mass index (BMI), history of previous lumber spine surgery were compared between patients who had intra operative dural tear and patients who do not have a dural tear (controls). The length of surgery (minutes), estimated blood loss during surgery (ml) and amount of drainage (ml) were also recorded and compared the data between

the two groups. In all cases in which an incidental durotomy had occurred one of the surgeon filled up a questionnaire, decompression that included data regarding tear. The statistical significance was evaluated using Chi-squared test with value of $p=0.05$.

RESULTS

This is a prospective study of 200 patients with different types of decompressive and reconstructive procedure in the lumbar region. 15 patients (7.5%) were of dural tear. In level 1 total patients were

102 in which 9 were instrumented and 93 were non instrumented. In level 1 total patients with dural tear were 4 in which 3 patients were instrumented and 1 was non instrumented. In level 2 total patients were 68 in which 14 were instrumented and 54 were non instrumented. In level 2 total patients with dural tear were 4 in which 3 patients were instrumented and 1 was non instrumented. In level >3 total patients were 30 in which 30 were instrumented. In level >3 total patients with dural tear were 7 in which 7 patients were instrumented. Mean duration of symptoms, mean time of surgery, complications were more in DT group.

Table 1: Dural tears in Lumbar spine surgery regarding no. of level involved and instrumentation

Number of levels	Patients			Dural tear		
	Total	Instrumented	Non instrumented	Total	Instrumented	Non instrumented
1	102	9	93	4	3	1
2	68	14	54	4	3	1
>3	30	30	0	7	7	0
	200	53	147	15	13	2

Table 2: Comparison among DT group and non DT group.

	DT group (n=15)	Non-DT group (n=185)
Mean duration of symptom (months)	14.8	13.6
Mean time of surgery (minutes)	95	63
Postoperative complications	10(66.66%)	28(15.13%)
Mean VAS score improvement (at 12 weeks)	5.6	7.3
ODI score improvement (at 12 weeks)	48.8	72.5

DISCUSSION

Dural tears (DT) is one of the frequent complications of spinal surgery and despite effective treatment modalities it is generally feared by Surgeons due to its possible serious consequences.¹⁴

This is a prospective study of 200 patients with different types of decompressive and reconstructive procedure in the lumbar region. 15 patients (7.5%) were of dural tear. In level 1 total patients were 102 in which 9 were instrumented and 93 were non instrumented. In level 1 total patients with dural tear were 4 in which 3 patients were instrumented and 1 was non instrumented. In level 2 total patients were 68 in which 14 were instrumented and 54 were non instrumented. In level 2 total patients with dural tear were 4 in which 3 patients were instrumented and 1 was non instrumented. In level >3 total patients were 30 in which 30 were instrumented. In level >3 total patients with dural tear were 7 in which 7 patients were instrumented. Mean duration of symptoms, mean time of surgery, complications were more in DT group.

Tsutomimoto T et al (2014) prospectively examined the incidence of dural tears and their influence on the outcome six months post-operatively in 555 consecutive patients. The incidence of dural tears was 5.05% (28/555). The risk factors were the age of the patient and the procedure of bilateral decompression via a unilateral approach. The rate of recovery of the Japanese Orthopaedic Association score in patients with dural tears was

significantly lower than that in those without a tear (77.7% vs. 87.6%; $p < 0.02$), although there were no significant differences in the improvement of the Oswestry Disability Index between the two groups. Most dural tears were small, managed by taking adequate care of symptoms of low cerebrospinal fluid pressure, and did not require direct dural repair. Routine MRI scans were undertaken six months post-operatively; four patients with a dural tear had recurrent or residual disc herniation and two had further stenosis, possibly because the dural tear prevented adequate decompression and removal of the fragments of disc during surgery; as yet, none of these patients have undergone further surgery.¹⁵ Yossi et al., did not found a difference in incidence of dural tear between patients who underwent decompression alone and patients who had decompression and instrumented fusion.¹⁶ Some study show higher incidence of DT in instrumentation.^{17,18} In a study Proietti L et al., showed complications in 16.2 % cases (complications in 55 patients out of 338 patients) in lumbar spine surgery.¹⁹

CONCLUSION

The present study concluded that Postoperative complications were more, and outcome was poor in DT group in comparison to non DT group.

REFERENCES

1. Williams BJ, Sansur CA, Smith JS et al. Incidence of unintended durotomy in spine surgery based on 108,478 cases. *Neurosurgery* 2011; 68:117–23.
2. Baker GA, Cizik AM, Bransford RJ, Bellabarba C, Konodi MA, Chapman JR, Lee MJ. Risk factors for unintended durotomy during spine surgery: a multivariate analysis. *Spine J* 2012; 12:121–6.
3. McMahon P, Dididze M, Levi AD. Incidental durotomy after spinal surgery: a prospective study in an academic institution. *J Neurosurg Spine* 2012; 17:30–6.
4. Cammisa FP Jr, Girardi FP, Sangani PK, Parvataneni HK, Cadag S, Sandhu HS: Incidental durotomy in spine surgery. *Spine (Phila Pa 1976)* 2000; 25:2663–7.
5. Guerin P, El Fegoun AB, Obeid I, Gille O, Lelong L, Luc S, et al. Incidental durotomy during spine surgery: incidence, management and complications. A retrospective review. *Injury* 2012; 43:397–401.
6. Ruban D, O'Toole JE. Management of incidental durotomy in minimally invasive spine surgery. *Neurosurg Focus* 2011; 31:E15.
7. Khan MH, Rihn J, Steele G, Davis R, Donaldson WF III, Kang JD, et al: Postoperative management protocol for incidental dural tears during degenerative lumbar spine surgery: a review of 3,183 consecutive degenerative lumbar cases. *Spine (Phila Pa 1976)* 2006; 31:2609–13.
8. Morgan-Hough CV, Jones PW, Eisenstein SM: Primary and revision lumbar discectomy. A 16-year review from one centre. *J Bone Joint Surg Br* 2003; 85:871–4.
9. Stolke D, Sollmann WP, Seifert V: Intra- and postoperative complications in lumbar disc surgery. *Spine (Phila Pa 1976)* 1989; 14:56–9.
10. Williams BJ, Sansur CA, Smith JS, Berven SH, Broadstone PA, Choma TJ, et al: Incidence of unintended durotomy in spine surgery based on 108,478 cases. *Neurosurgery* 2011; 68:117–24.
11. Bosacco SJ, Gardner MJ, Guille JT. Evaluation and treatment of dural tears in lumbar spine surgery. *Clin Orthop* 2001; 389:238–47.
12. Mayfield FH, Kurokawa K. Watertight closure of spinal dura mater: technical note. *J Neurosurg* 1975; 43:639–40.
13. Mokri B. Spontaneous cerebrospinal fluid leaks: from intracranial hypotension to cerebrospinal fluid hypovolemia—evolution of a concept. *Mayo Clin Proc* 1999; 74:1113–23.
14. Serdal Albayrak, Saet Ozturk, Omer Ayden and Necati Ucler. Dural Tear: A Feared Complication of Lumbar Discectomy. *JTNEPUB_14065_online.pdf*.
15. Tsutsumimoto T, Yui M, Uehara M, Ohta H, Kosaku H, Misawa H. A prospective study of the incidence and outcomes of incidental dural tears in microendoscopic lumbar decompressive surgery. *The bone & joint journal*. 2014 May;96(5):641-5.
16. Yossi Smorgick, Kevin C Baker, Harry Herkowitz, David Montgomery, Siddhorth A Badve, Casey Bachison, Steven Ericksen and Jeffrey S Fischgrund. Predisposing factors for Dural tear in patients undergoing Lumbar Spine surgery. *J Neurosurg Spine* 2015; 22: 483-6.
17. Deyo RA, Cherkin Dc, Loeser DJ, Bigos SJ, Ciol MA. Morbidity and mortality in association with operations on lumbar spine. The influence of age, diagnosis and procedure. *J Bone Joint Surg Am* 1992; 74: 536-43.
18. Kalevski SK, Peev NA, Haritonov DG. Incidental dural tear tears in lumbar decompressive surgery: incidence, causes, treatment, results. *Asian J Neurosurg* 2010; 5: 54-9.
19. Luca Proitti, Laura Scaramuzzo, Giusappo K Schiro, Sergio Sessa and Carlo A logroscino. Complications in Lumbar Spine Surgery. A retrospective analysis. *Indian J Orthop*. 2013 Jul-Aug; 47(4): 340-5.

Source of Support: Nil.

Conflict of Interest: None Declared.

Copyright: © the author(s) and publisher. IJMRP is an official publication of Ibn Sina Academy of Medieval Medicine & Sciences, registered in 2001 under Indian Trusts Act, 1882. This is an open access article distributed under the terms of the Creative Commons Attribution Non-commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

Cite this article as: Vijay Kumar Dahiya, Simple Chahar. A Prospective Analysis of Dural Tears Among Patients of Lumbar Spine Surgery at a Tertiary Care Hospital. *Int J Med Res Prof*. 2019 Nov; 5(6): 236-38. DOI:10.21276/ijmrp.2019.5.6.054