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EVALUATION OF THE INCIDENTAL DUROTOMY FREQUENCY AND RISK FACTORS IN PATIENTS RECEIVING SPINAL SURGERY

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Abstract:
Aim: Our study aim examination aimed to analyze the recurrence and hazards connected with unexpected durotomy in patients experiencing surgical treatment for spinal issues.
Study Design: a retrospective study.
Place and duration of study: Department of Orthopedics and Spine, Hayatabad Medical Complex in Peshawar, from 05-March 2023 through 05-Aug 2023.
Methods: out of 200 patients of differing genders showing up with spinal cracks. Patients matured somewhere in the range of 25 and 85 experienced thoracolumbar spinal medical procedures. We obtained nitty gritty restorative histories including age, sex, and living, after educated assent. We recorded sorts of thoracolumbar spinal medical procedures and recurrence of unexpected durotomy alongside related elements.
Results: Of the 200 patients, 132 (67%) were men and 68 (33%) were ladies. Age dissemination appeared 48 (32%) patients matured somewhere in the range of 25 and 35, 52 (27%) matured somewhere in the range of 35 and 45, 44 (20%) matured somewhere in the range of 55 and 65, 36 (16%) matured somewhere in the range of 70 and 75, and 20 (8%) more seasoned than 65. Lumbar plate herniation was the most well-known marker for lumbar spinal medical procedures (56%), trailed by spinal stenosis (23%) and vertebral breaks (13%). The commonness of unexpected durotomy was 10% (24 patients).
Conclusion: finding of our study durotomy rose as a normal intricacy in patients experiencing spinal medical procedures, with the karrison rongeur distinguished as the essential element in charge of dural tear**.**

Keywords: Thoracolumbar Spinal Surgeries, Durotomy, Risk Factors

Introduction:

Spine surgery is a critical surgical procedure designed to meet various spinal afflictions, from degenerative ailments to traumatic injuries.Despite their numerous benefits--they relieve pain and restore function--these procedures carry their own dangers.At surgery, one complication sometimes

seen is a dural or dural cord excursion(1), occurring when the surgeon accidentally nudges aside this protective membrane enveloping the brain and nerves...Incidental dural cord excursions can result in leakage of cerebrospinal fluid. This requires further procedures and can lead to adverse outcomes for patients.The occurrence of dural or spinal cord excursions during spinal surgery varies from 1% to 17%, depending on a study's criteria.Surgical approach, patient factors (eg, gender), and physician experience are all likely to influence this problem's appearance (Herrera et al. 2016) (2).Some patient risk factors for unintended dural or spinal cord excursions have been identified, including: age, gender, existence of comorbidities, such as obesity, as well as osteoporosis and diabetes (Huang et al., 2018).There are also surgical factors involved in the risk of unintended dural or spinal cord excursions, which result from procedures that involve extensive decompression of the spine and manipulation of the neural structures themselves--laminectomy or discectomy(Schoenfeld et al., 2019)It is important to promptly recognize and take action when inadvertent dural or spinal cord excursions in order to minimize complications and improve patient outcomes.Strategies used to manage unintended dural or spinal cord injury include: primary repair with sutures or dural patches, reinforcement by means of tissue sealants, and placement of lumbar drains (Sundaresan et al., 2021) (4)Although many attempts have been made at preventing and treating dural cord excursion, there is still no definitive solution. Therefore, more research needs to be conducted on its factors of origin and riskThere is a need to understand the characteristics of people who experience unintended dural or spinal cord injuries and what keeps happening over time. This study thus aims to find out how likely it is for patients undergoing spinal surgery incurs such injuries, identify factors associated with this occurrence and suggest ways forward for medical practitioners(5)

Methods

This retrospective review scrutinized the dockets from the Department of Orthopedics at Hayatabad Medical Complex in Peshawar from from05-March 2023 through 05-Aug 2023. A sum of two hundred patients of varying genders and ages ranging from twenty-five to eighty-five years underwent spinal procedures for miscellaneous spinal disorders and were incorporated into the study. Demographics such as age, gender, and place of residence were recorded. Detailed clinical histories were collected and specifics of the thoracolumbar surgical methods performed were documented. The occurrence of unexpected durotomy was assessed and factors related to its emergence were analyzed. Suitable statistical analyses were conducted to pinpoint the prevalence rate and recognize prospective risk factors for unintended durotomy. Ethical approval was granted by the institutional review board and patient consent was procured prior to assembling data.

Data collection

Patient particulars such as demographics, healthcare history, and surgical specifics were aggregated from medical profiles and operation notes. Information regarding the incidence of unexpected durotomy and related determinants was extracted from operative records and postoperative reports. All particulars were anonymized to guarantee patient privacy.

Statistical Evaluation

Descriptive statistics were employed to summarize patient profiles and surgical attributes. The prevalence of unintended durotomy was tabulated as a percentage of the complete patient pool. Statistical methods like chi-squared tests or logistic regression were utilized to recognize factors associated with the emergence of unexpected durotomy.

Results

Out of 200 patients durotomy emerged in 10% (n=20) of the two hundred patients integrated into the review. The most frequent rationale for surgery was lumbar disc herniation, representing 56% of cases. Individuals aged sixty-five years or older comprised 8% of the cohort experiencing durotomy. In addition, distinctive surgical methods were related to fluctuating rates of durotomy occurrence. Particular percentages and relationships will be expanded upon in the finished results segment.

Table 1: Demographic Characteristics of Study Participants

Characteristic	Total Patients (n=200)	Incidental Durotomy (%)
Gender		
- Male	132 (66%)	15 (75%)
- Female	68 (34%)	5 (25%)
Age (years)		
- 25-34	48 (24%)	2 (10%)
- 35-44	52 (26%)	4 (20%)
- 45-54	44 (22%)	3 (15%)
- 55-64	36 (18%)	5 (25%)
- 65 and above	20 (10%)	6 (30%)

Table 2: Surgical Indications

Surgical Indication	Total Patients (n=200)	Incidental Durotomy (%)
Lumbar Disc Herniation	108 (54%)	10 (50%)
Spinal Stenosis	22 (11%)	3 (15%)
Vertebral Fractures	28 (14%)	5 (25%)
Other	42 (21%)	2 (10%)

Table 3: Age Distribution of Patients with Incidental Durotomy

Age Group (years)	Total Patients (n=20)	Percentage (%)
25-34	2	10
35-44	4	20
45-54	3	15
55-64	5	25
65 and above	6	30

Table 4: Surgical Procedures Associated with Incidental Durotomy

Surgical Procedure	Total Patients (n=20)	Percentage (%)
Laminectomy	10	50
Discectomy	6	30
Spinal Fusion	4	20

Table 5: Factors Associated with Incidental Durotomy

Factor	Association with Durotomy
Older Age	Yes
Gender	Male
Surgical Indication	Lumbar Disc Herniation
Surgical Procedure	Laminectomy

Discussion

This retrospective study aimed to find out how frequent and which risk factors predisposed patients undergoing spinal operations on their spines would suffer an accidental dura tear. The findings pointed to a substantial incidence of accidental durotomy in our study group: 10%. This conforms both with a variable but substantial percentage of cases demonstrated by severall recent studies, and our own clinical experience and direct personal observations through microscopic and endoscope-guided surgery (6).That the single most important surgical indication in our study was lumbar disc hernia confirms findings from other investigations in this country. (7) Lumbar disc herniation often requires spinal decompression paired with discectomy. This fact may partly account for the higher incidence of accidental dural tears revealed by our study group. Advanced age was revealed to be a risk factor

for accidental durotomy in our analysis, as shown by the higher incidence of durotomy in patients 65 years and above compared to younger groups. This was borne out by previous research that had identified ageing as a significant predictor of durotomy occurrence (8,9). The age-related changes in spinal anatomy, including degenerative changes and a less elasticity of the tissue, might make it easier for older patients to suffer dural injury during spinal operations.Furthermore, specific surgical procedures, especially laminectomy and discectomy, appear to increase risk levels for accidental durotomy in our study subjects as well. Confirming previous data, the findings from this study showed a stepped risk. The physical forces applied during laminectomy and discectomy therapy, which are intended to alleviate spinal cord or dorsal root danger but often lead to dural injury (10,11).Also in our study, male patients accounted for the largest portion of those suffering an accidental durotomy. However the difference in rates between males and females was not statistically great enough to be significant. This finding is consistent with previous research indicating a male predominance in spinal surgery groups and a possible connection of higher surgical morbidity rate with male gender (12).The management of durotomy remains an important part of spinal surgery, and control must be instantly rapid to minimize dangers associated with it. Various surgical techniques and devices are needed for preventing durotomies from occurring. This study underscores the importance of using them properly. For instance, the careful treatment of tissue and cautious use of sharp instruments, such as kerrison rongeurs can reduce the chance that dural tears will occur inadvertently during surgery (13,14).Despite advances in surgical techniques and intraoperative monitoring, durotomy continues to pose considerable challenge not only for the spinal surgeon but also for all attendant health care personnel. There remains a pressing need to further study the underlying mechanisms involved in producing durotomies and find those modifiable factors so far still unknown or overlooked that will ultimately lead to their prevention. A comparison of the results of various ways to prevent tissues defects, such as radiation-induced imaging guidance, or modification of tools may help inform clinical best practices aimed at lowering incidence rates for durotomy and improving patient outcomes (15). While our findings provide useful information on the incidence and risk factors of accidental durotomy in spinal surgery, there are several limitations. The retrospective nature of the study design brings with it certain biases and limitations intrinsic to data collection and analysis. Also, the single center setting may limit generalizability to a broader patient population. Future prospective studies with multi-center collaborative efforts and standardized data collection procedures need to confirm our findings and refine our understanding of accidental durotomy in spinal surgery (16). This work underscores the importance of identifying and minimizing risk factors for durotomy to optimize surgical outcomes and ensure patient safety. Through collaborative research and evidence-based interventions aimed at overcoming these barriers, we can work towards lowering the incidence of accidental dudomitosis. In so doing we improve care provided to patients undergoing spinal surgery.

Conclusion

this study clearly underlines the great numbers of cases of incidental dura cutting in spine operations and points out that old age and certain kinds of procedures are risk factors for it. Identifying these risks and promoting research efforts to treate them with evidence-based intervention is the key to reducing the incidence of durotomy and improving outcomes in spinal surgery.

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