



Incidental Durotomies: Patch?, Stitch?, Clip? or Seal



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OBJECTIVES

- ❖ Examine the prevalence of incidental durotomies in lumbar spine surgery.
- ❖ Assess the efficacy of different dural repair techniques.
- ❖ Determine best practice and recommendations for repair of incidental durotomies.

INTRODUCTION

Incidental durotomy (ID) is the inadvertent tear in the spinal dural mater during spinal surgery, incidences ranges from 1% to 17%⁽¹⁾. Inadequate closure of such dural tear can cause CSF leakage leading to headache, nausea and vomiting, neuropathy, pseudomeningocele and arachnoiditis⁽²⁾. No national guidelines exist for ID management and repair decisions are often based on the expertise of the operating surgeon. The following management techniques can be used as monotherapy or in combination with one another (table 1):

TYPE	TECHNIQUE
Sealant	DuraSeal, Tisseel
Primary Closure	LeMaitre Clips (AnastoClips GC [®]), Liga clips, suturing
Patch/Graft	Fat graft, Muscle patch, Duragen

Table 1. Different types of Incidental Durotomy repair techniques

LeMaitre clips are a newer technique, with clips placed in an interrupted manner facilitating dural closure, thus eliminating CSF leakage occurring from suture holes⁽³⁾. Previous literature on this topic by Choi et al 2021 has shown that the combination of primary closure (suturing/clips) and graft/patch has the lowest CSF leakage rate of 5.5% post ID repair ⁽⁴⁾.

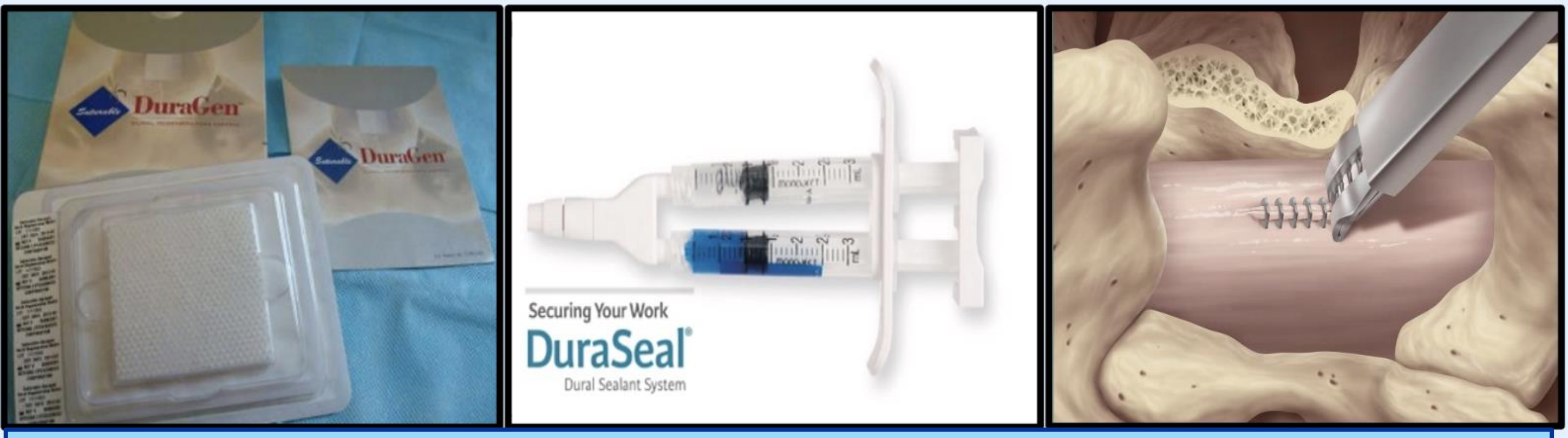


Figure 1. (a) Duragen (b) DuraSeal (c) LeMaitre Clips (AnastoClips GC[®])

METHODS

Retrospective data collection and analysis of ID in adult patients having lumbar spine surgery at University Hospital Wales and Llandough over ten years (2013-2023). BlueSpier software was used to identify all patients having a lumbar procedure resulting in an ID. Data collected included whether it was primary or revision surgery, type of lumbar procedure, ID repair technique, days of post-op bed rest, lumbar wound drain. Welsh Clinical Portal was used to collect data on post-operative complications and types of lumbar procedure carried out over the period. SPSS* software was used for descriptive statistics and cross-tabulation tables.

*Statistical Package for the Social Sciences
References: 1. Ishikura H, Ogiwara S, Oka H, Maruyama T, Inanami H, Miyoshi K, et al. Risk factors for incidental durotomy during posterior open spine surgery for degenerative diseases in adults: A multicenter observational study [Internet]. U.S. National Library of Medicine; 2017 [cited 2024 May 6]. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5708748/>
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3. Anastroclip GC[®] closure system [Internet]. [cited 2024 May 8]. Available from: <https://www.lemaitre.com/products/anastroclip-gc-closure-system>
4. Choi EH, Chan AY, Brown NJ, Lien BV, Sahyouni R, Chan AK, et al. Effectiveness of repair techniques for Spinal Dural Tears: A systematic review. World Neurosurgery. 2021 May;149:140-7. doi:10.1016/j.wneu.2021.02.079

RESULTS

- 139 ID cases, mean age 59y ±15.4yrs, range 25 – 87y.
- 70-79yrs age group had the highest proportion of ID (n=40), but this cohort had fewer complications.
- Chi-squared test on gender p-value = 0.67.
- Primary repair procedures had 18% average complication.
- Post ID repair and revision repairs 32% (Table 2).

ALL SURGERIES	TOTAL	NUMBER OF ID	INCIDENCE
Primary Lumbar decompression	1094	49	5%
Revision Lumbar decompression	36	19	52%
Primary Lumbar discectomy	287	6	2%
Revision Lumbar discectomy	31	4	13%
Primary discectomy+decompression	176	17	9.6%
Revision discectomy+decompression	32	4	12.5%
ALIF	86	1	1%
TLIF/PLIF	227	15	6.6%
Lumbar decompression and fusion	134	24	10%

Table 2. Incidence of ID in lumbar procedures

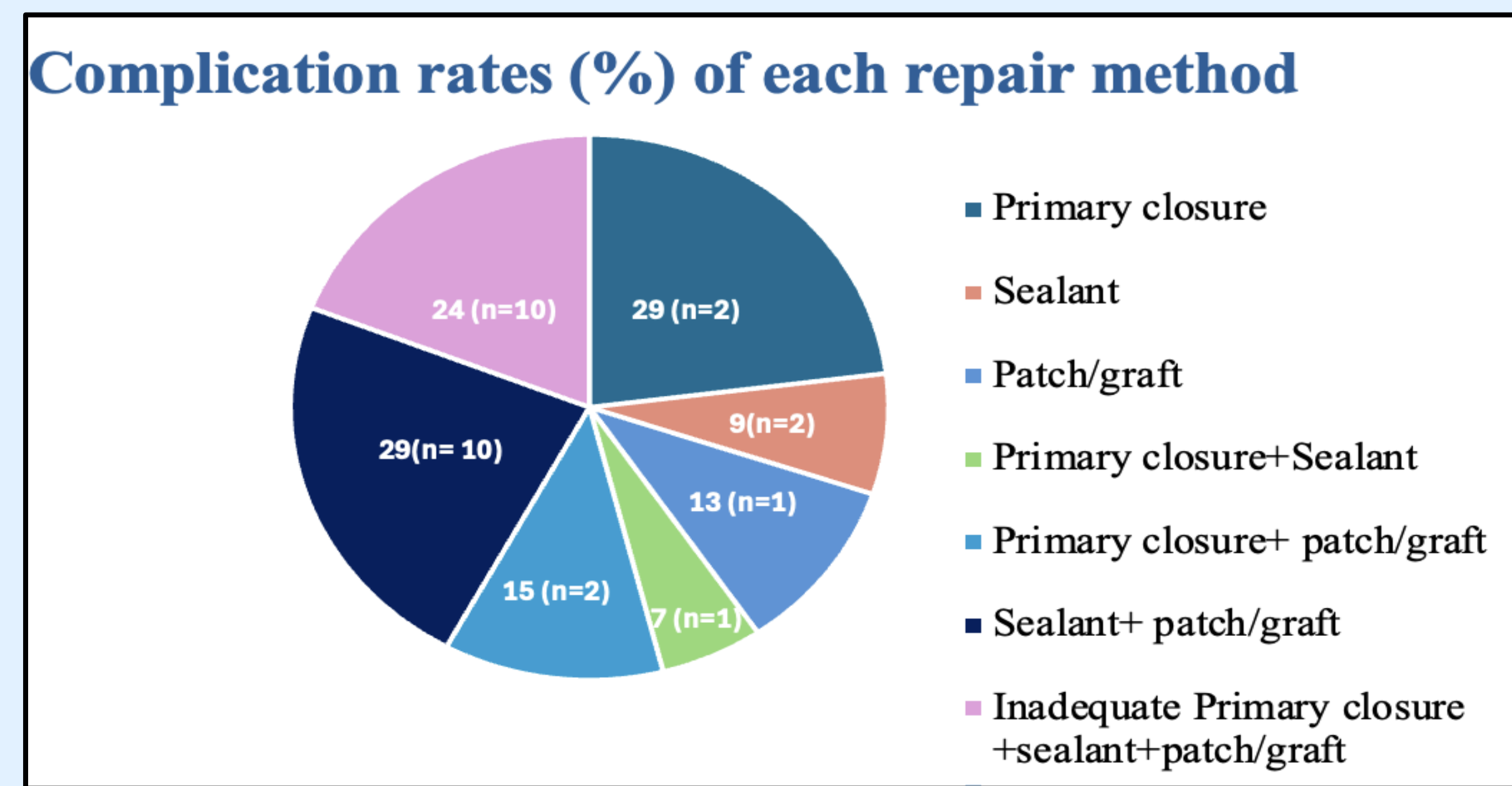


Figure 2. Complication rates by repair method

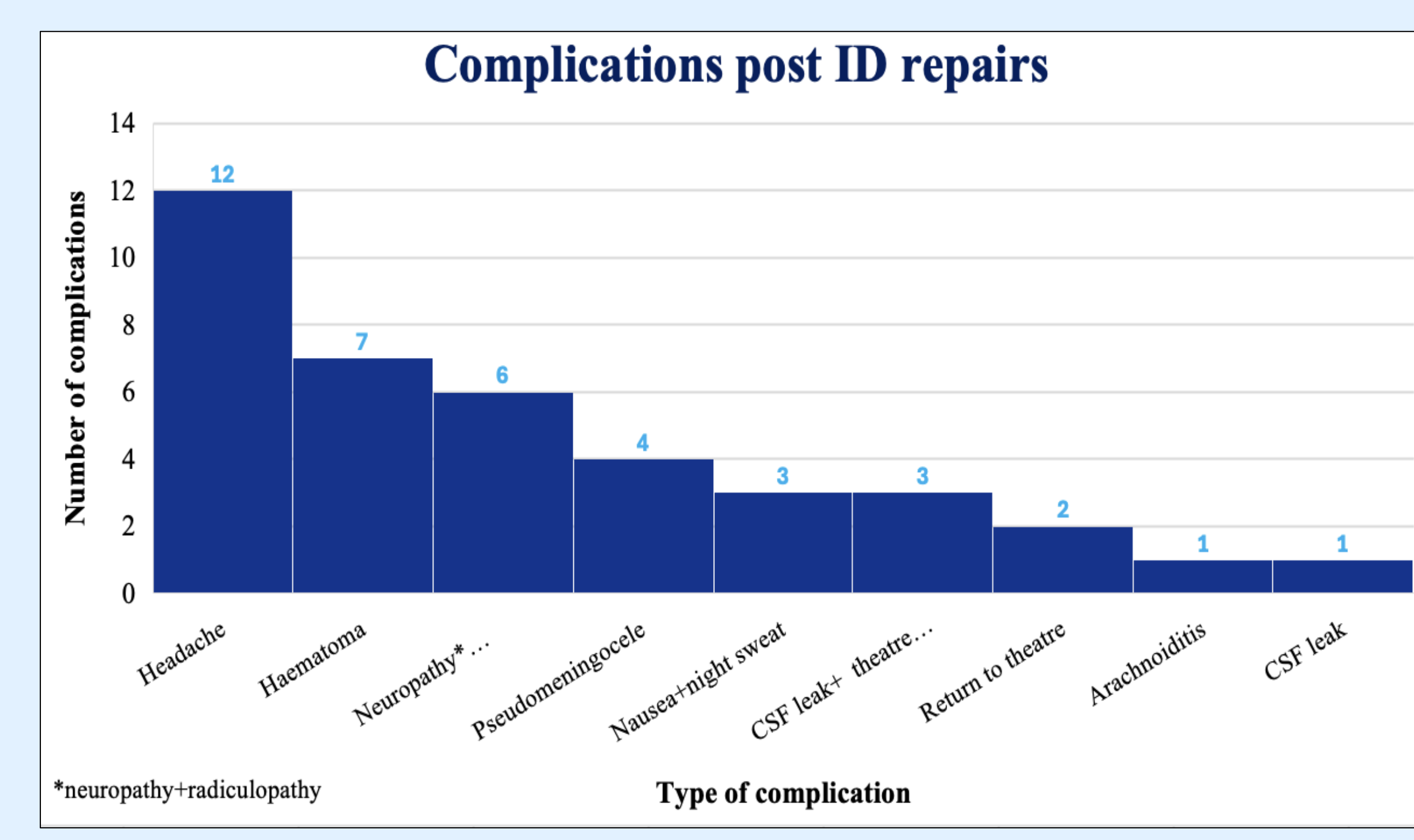


Figure 3. ID complication prevalence

CONCLUSION

- The overall ID rate was 6% (139/2103) in this study.
- Headaches (n=12) and haematoma (n=7) were the most frequently recorded complication.
- Spinal revision procedures have highest ID rates due to adhesions from previous surgeries and lack of natural barriers (bone, ligament, fat).Sealant/patch/graft and inadequate primary closure and sealant + patch/graft had highest complication rates.

