



A SINGLE-CENTRE REVIEW OF PERIOPERATIVE COMPLICATIONS IN LUMBOSACRAL SPINE INSTRUMENTATION SURGERY

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ABSTRACT **Background :** Globally, a gradual rise has been noticed in the number of spine instrumentation procedures. With the rise in number , there's a need for an appropriate understanding and documentation of perioperative complications for early diagnosis and treatment.**Aim :** Aim of this study is to observe the perioperative complications for patients undergoing Lumbosacral spine instrumentation surgeries.**Material and Methods :** This is a type of retrospective, observational study , done at St Jhon's Hospital and medical college, Bengaluru from 1st January 2025 to 1st July 2025. All 52 patients who underwent Lumbar spine surgery were included and their demographic data along with postoperative complications were documented.**Results :** The complications that we came across in our study post Lumbosacral spine surgery were postoperative chronic pain(11.1%), surgical site infections(SSI)(8%), deep venous thrombosis (DVT)(4.4%) , foot drop(4.4%)and implant failure(2.2%). **Conclusion:** Regular follow up and knowledge of postoperative complications is imperative for early recognition and proper management. Most of the complications can be avoided by using sterile techniques in perioperative period, meticulous operative techniques with gentle handling of tissues , good implant quality and early mobilisation and physiotherapy.

KEYWORDS : lumbosacral spine surgeries, postoperative complications

INTRODUCTION

According to the several recent databases, an increasing trend is noticed in the number of Spine instrumentation surgeries performed of Degenerative Spine Disease.² With ageing population, early diagnosis and advancement of the Surgical techniques more number of patients are now undergoing Spine Stabilisation procedures. The complications post spinal surgery has been consistently underreported in literature. Lack of proper understanding and documentation of perioperative complications can lead to delay in recognition and appropriate management of the same.

MATERIALS AND METHODS

This is a type of retrospective, observational study , done at St Jhon's Hospital and medical college, Bengaluru from 1st January 2025 to 1st July 2025. Institutional Ethics Committee approval was taken. All the 52 patients who underwent Lumbar spine instrumentation surgery in this time period were included in this study. Pre-operative period , demographic details and BMI of the patients were documented, with their neurological examination and associated deficits, VAS score and co morbidities. Operative details, Postoperative period recovery, VAS score, fresh neurological deficits were noted down. Any adverse event in the postoperative period was also documented.. All patients were followed up for a period of 90 days postoperatively.

Data was entered into Microsoft Excel (Windows 10; Version 2021) and analyses were done using the Statistical Package for Social Sciences (SPSS) for Windows software (version 27.0; SPSS Inc, Chicago). Descriptive statistics such as mean and standard deviation (SD) for continuous variables, frequencies and percentages were calculated for categorical Variables. Paired t test was used to compare VAS between pre op and post op. chi-Square and Fisher's exact test were used to show association between Categorical variables and complications. Bar charts and Pie charts were used for visual representation of the analysed data. Line diagram was used to show trend of VAS over time. Level of significance was set at 0.05.

RESULTS

A total of 45 patients were included in this study who had undergone Lumbar Spine instrumentation surgery for Degenerative Spine disease. Out of 45 cases 23 were male (51.1%) and 22 were females (48.9%). The p value (1.0) of difference in gender distribution was not significant.

27 patients were in the Age group of 40-60 years (60%) and 10 patients were in the age group of 60-70 years(22.2%). Out of 45, 38 patients had Degenerative listhesis (84%) and 7 patients had multilevel Posterior intervertebral Disc prolapse(PIVD) (15%).

11 out of 45 patients (24.4%) had osteopenia preoperatively, who were optimised before surgery with regular postoperative follow up. Oral calcium and vitamin D3 supplements were started and cement augmented screws were used for the instrumentation.

4 patients out of 45 had features of neurogenic bladder and 3 of them had symptomatic improvement post Lumbar spine surgery (p value : 0.325). 40 patients out of 45 had reduction in radicular pain on POD1 with average VAS score of 0.9 on POD1 and 0.26 on POD3. 5 patients had persistent complaints of radicular pain till 3 months postoperatively. The p value is of <0.0001 stating the surgery was significant in reducing postoperative pain.

5 patients in our study underwent redo surgery after initial Decompressive laminectomy done in last 2-5 years in outside centers. Out of these 5 patients, 3patients (60%) had osteopenia for which they were evaluated and treated appropriately with Calcium and Vitamin D supplements (p value : 0.655).

On evaluating Post-operative complications, 4 patients had incidence of postoperative wound dehiscence. On assessing the BMI of this group, one patient was found to be obese and the rest three patients were overweight (p value : 0.317). 3 out of these 4 patients also had controlled Type II Diabetes mellitus (p value : 0.625).

2 out of 45 patients(4.4%) had postoperative DVT(Deep venous thromboembolism) and both patients had BMI of more than 23kg/m²(overweight)(p value : 0.5).

Two patients had post operative foot drop, which was treated conservatively with foot drop splint and physical therapy. One patient had undergone 3 level instrumentation and other had undergone 4 level spinal instrumentation procedure (p value : 0.075).

Two patients had postoperative DVT (4.4%), which was treated conservatively with anticoagulants (p value : 0.075).

One patient was diagnosed to have implant failure (2.2%) on follow up

and was taken up for Redo surgery and implant removal (p value : 0.603). On assessing the demographics patient was overweight and had osteopenia on DEXA scan.

Table 1. comparison of postoperative complications from corresponding similar studies in literature

Complication	Incidence in our study	Incidence in literature	Management
Chronic Pain	11.1 %	8-40 % ⁸	Analgesics
SSI	8 %	0.7-16 % ⁵	Intravenous antibiotics
Foot drop	4.4 %	0-56 % ³	Physical Therapy
Deep venous thrombosis (DVT)	4.4 %	<1 % ⁷	Anticoagulation therapy
Implant Failure	2.2%	4.6 % ⁶	Redo Surgery

DISCUSSION

The most common age group with symptomatic lumbar spine disease in our study was 40-60 years.

Patients undergoing redo surgery, though 60% patients had osteopenia the difference was not statistically significant to attribute osteopenia as a cause for disease recurrence.

In a Review article published by Richard et al., the incidence of chronic pain post lumbar spine surgery, also known as Failed Back Surgery Syndrome (FBSS) is around 8-40%.⁸ In our study, we had 5 patients(11.1%) with FBSS who were managed conservatively with analgesics

In our study 60% of patients were in the age group of 40-60 yrs , In the literature , wound complication rates post Lumbar spine fusion surgeries is approximately 0.7-16.1 % . The known risk factors for the same are increasing age, Diabetes Mellitus , obesity , anaemia and steroid supplementation.⁵ In our study , 4 patients (had post operative wound dehiscence, out of which one patient had BMI of more than 30kg/m² and 3 patients had BMI of more than 23 Kg/m². 3 out of 4 patients had controlled diabetes mellitus and two patients were of 60 years of age.

In a review article , published by Basques et al, foot drop was noticed in upto 56% patients postoperatively. Possible mechanisms of Foot drop postoperatively were postulated to be Direct trauma, stretch injury, compression or ischaemia. Iatrogenic foot drop can happen due to direct trauma to the cord or L5 nerve root intraoperatively due to errantly placed retractors, improper placements of implants and more devastatingly L5 root transection.³ In our study 2 patients(4.4%) had post operative foot drop, which was treated conservatively with foot drop orthosis and physical therapy.

A retrospective cohort study done by Kim et al., found that rate of Redo surgeries were higher in older age group, in patients post laminectomy and in patients with comorbidities. The Reoperation rates were 8.6%, 14.7%, 13.8%, 12.4%, and 11.8% after laminectomy, nucleolysis, open discectomy, endoscopic discectomy, and fusion, respectively.⁴ In our study we had 5 patients who underwent Redo Lumbar spine fusion surgeries , out of which 2 patients were of more than 60 yrs of age and all 5 had undergone laminectomy as the initial procedure and 3 patients had osteopenia at the time of admission.

In a Retrospective study done by Bouyer, B et al., incidence of DVT post lumbar spine surgery was found to be <1% , but was also influence by several risk factors such as, age, gender , obesity, immobility, previous Venous Thromboembolism and contraceptive usage.⁷ In our study we had 2 patients with postoperative DVT (4.4%), both patients had BMI of more than 23kg/m².

In a retrospective study done by Koshimizu H et al., the overall incidence of implant-related complications in spinal surgeries was found to be 4.6% with main causes of reoperation to be screw malposition (72.2%), screw loosening or pull out (81.8%) and rod or screw fracture (60.9%).⁶ In our study we had one patient (2.2%) with screw breakage, diagnosed at 3 months postoperatively. Patient was advised to undergo redo surgery and implant removal.

CONCLUSION

In this study, complications observed post Lumbar spine instrumentation surgery were SSI(surgical site infections), Deep venous thromboembolism, Implant failure, Chronic pain and foot

drop. Regular follow up and knowledge of postoperative complications is imperative for early recognition and proper management. Appropriate glycaemic control in the perioperative period, healthy Bone mineral density, Sterile operative techniques, gentle tissue handling, early postoperative mobilisation, good quality implants can help us avoid most of the postoperative complications. We still lack an established classification system for complications post Spinal surgeries which is universally accepted. There is a need for studies on a larger scale in multiracial communities for better understanding and management of post operative complications.

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