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Original Article

Primary spinal infections: A retrospective review of instrumentation use and graft selection

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ABSTRACT

Background: The use of instrumentation in the setting of primary spinal infections is controversial. While the instrumentation is often required in the presence of progressive deformity due to spinal osteomyelitis (SO), discitis (SD), or spinal epidural abscesses (SEA), many surgeons are concerned about instrumentation increasing the risk of infection recurrence and/or persistence warranting reoperation.

Methods: We retrospectively reviewed the need for reoperations for persistent infections in 119 patients who presented with primary spinal infections. They were treated with decompressions with/without non-instrumented fusion (70 patients) versus decompressions with instrumented fusions (49 patients).

Results: The use of primary spinal instrumentation in the presence of infection (SO/SD/SEA) did not increase the requirement for repeated surgery due to recurrent/residual infection when compared to those undergoing decompressions with/without non-instrumented fusions. Of 49 patients who initially required instrumentation, 6 (12.5%) required reoperations for recurrent or residual infection. For the 71 undergoing index decompressions for infection with/without non-instrumented fusion, 9 (12.7%), or nearly an identical percentage, required reoperations for recurrent/residual infection ($P = 0.93$).

Conclusion: The use of instrumentation in the treatment of primary spinal infections in a small sample of just 49 patients did not increase the risk for persistent infection warranting reoperations versus 70 patients undergoing initial decompressions with/without non-instrumented fusions.

Keywords: Discitis, Epidural abscess, Osteomyelitis

INTRODUCTION

Primary spinal infections occur in 1/100,000 persons annually.[2] The treatment of primary spinal infections is largely with antibiotics. However, a subset of these patients may require surgery consisting of decompression alone with/without non instrumented fusions or with instrumented fusions (i.e. the latter to maintain structural stability).[4,5] Here, we retrospectively reviewed of the risk of recurrent postoperative infection warranting additional surgery in 49 patients undergoing primary instrumented spinal fusions for diskitis/osteomyelitis/spinal epidural abscess versus 71 treated with decompressions with/without non-instrumented fusions.

MATERIALS AND METHODS

Two authors retrospectively reviewed 49 patients (2000–2020) who required spinal instrumentation (all Titanium) versus 71 undergoing decompressions with/without non-instrumented fusions for the treatment of spinal osteomyelitis (SO), discitis (SC), and spinal epidural abscesses (SEA). The primary outcome we focused on was the need for repeated spinal surgery to address recurrent/persistent postoperative infection within 1 year of the index surgery.

Statistical evaluation

Categorial variables were assessed using Chi-squared analysis and continuous variables were assessed using the students two sample *t*-test. Analysis of variance (ANOVA) was utilized for comparison of multiple categorical variables.

RESULTS

The 119 patients who required surgical intervention averaged age of 58.1 ± 13.7 years of age, and underwent either decompressions with instrumented fusions (49 patients) or decompressions with or without non-instrumented fusions. There were no significant differences in multiple variables for those receiving instrumentation, except alcohol use which was significantly greater in the latter group ($P = 0.03$) [Table 1].

Instrumentation did not increase reoperation rates

The use of instrumentation in the presence of a primary spinal infection for SO/SD/SEA did not increase the reoperation rates for recurrent/residual infection: 6/49 (12.0%) undergoing primary instrumented fusions required reoperations versus 9/70 (13.0%) undergoing decompressions with/without non-instrumented fusions ($P = 0.87$).

DISCUSSION

In the presence of active infection, the use of foreign bodies including spinal instrumentation is generally avoided due to the potential for it to serve as a nidus for recurrent infection.[6,7] In 2010, Sierra-Hoffman *et al.* showed that 26 of 737 patients developed postoperative infections after undergoing thoracolumbar fusions.[8] In 1995, Abbey *et al.* found that 34

Table 1: Demographics differences between instrumentation vs no instrumentation spinal fusions.

	Instrumentation (*n*=49)	No instrumentation (*n*=70)	*P*-value
Age	58.9±11.0	58.3±14.1	0.80
Sex			
Male	23	39	
Female	26	31	0.35
Race			
White	43	60	
Black	2	0	
American Indian	2	3	
Other	2	2	0.80
BMI	31.0±7.2	32.0±7.7	0.47
Diabetes	27	42	0.59
Endocarditis	29	36	0.40
Tobacco			
Current	6	12	
Former	18	21	0.44
Alcohol	7	22	**0.03**

Bold = $P<0.05$

Table 2: Summary of the literature involving complications and infections in spinal fusions.

Study	Type of surgeries	Number of patients	Surgical site infections (%)	Removal of hardware (%)
Sierra-Hoffman *et al.*	Instrumented thoracolumbar fusions	737	26 (3.5)	6 (0.8)
Abbey *et al.*	Instrumented fusions	1,054	34 (3.7)	2 (0.1)
Bydon *et al.*	Decompression or/and Instrumented fusions	118	118 (100)	21 (17.8)
Garza-Ramos *et al.*	Instrumented fusions	931	15 (1.6)	42 (4.5)

of 1054 patients undergoing instrumented fusions developed postoperative surgical site infections, with implant removal required in 12 (35.3%).[1] Bydon *et al*. in 2014 evaluated 117 patients who underwent surgery for primary spinal infection; 36 patents required decompression alone versus 82 who required decompression and fusion; there were no significant differences in the rate of recurrent infections for those undergoing decompressions with/without instrumented fusions (i.e., 19.44% of decompression) versus those having instrumented fusions (i.e., 17.1%), or in the rates of continued osteomyelitis or discitis between the two groups.[2] Garza-Ramos *et al*. concluded reviewing 26 publications that patients undergoing instrumented fusions for primary spinal infections had a low (1.6%) risk for recurrent infection, and a 4.5% reoperation rate when other complications such as pseudoarthrosis and instrumentation failures were excluded [Table 2].[3]

CONCLUSION

The use of spinal instrumentation for the treatment of primary spinal infections in 49 patients did not increase the risk of persistent/recurrent infection when compared with 71 patients undergoing decompressions with/without non-instrumented fusions.

Declaration of patient consent

Institutional Review Board (IRB) permission obtained for the study.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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