

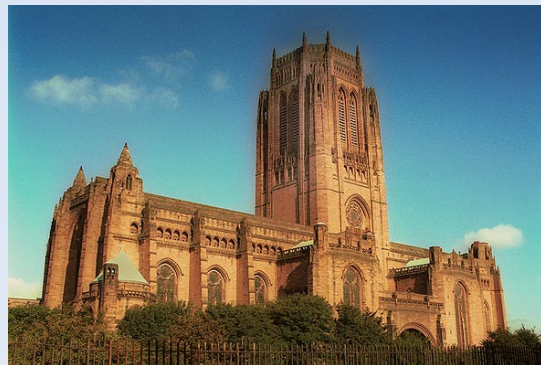


Are Percutaneous Pedicle Screws More Accurate than Open?

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OBJECTIVE

Compare the accuracy of open and percutaneous pedicle screw insertion by five spinal surgeons in a regional neuroscience unit over one year



INTRODUCTION

Accuracy of pedicle screw placement is important to:

- achieve mechanically robust constructs
- avoid injury to neural and vascular structures

Percutaneous techniques are associated with:

- less post-operative pain
- faster mobilisation
- fewer wound problems



POPULATION

February 2011 – February 2012

- 163 pedicle screw fixation cases
- 89 had post-op CT accuracy for assessment
- 66 open technique; 23 percutaneous technique

Indications: malignancy, trauma, infection,
degenerative disease



SURGICAL TECHNIQUE

Open

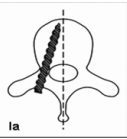
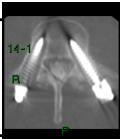
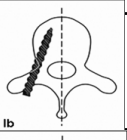
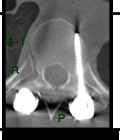
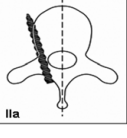
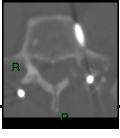
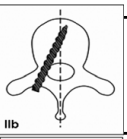
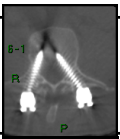
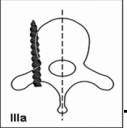
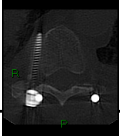
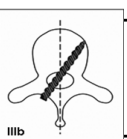
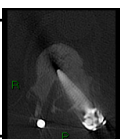
- Midline standard muscle strip/mini-open technique using Wiltse approach
- Screw insertion using anatomical landmarks, pedicle probing and biplanar fluoroscopy
- Five Systems used: (USSII/Legacy/Matrix/Expedium/Xia)

Percutaneous

- Lateral stab incisions with dilators +/- midline decompression
- Biplanar fluoroscopy
- Three systems used (Mantis/Longitude/Viper)

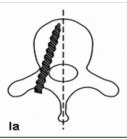
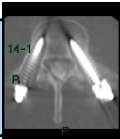
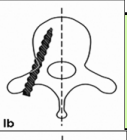
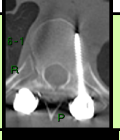
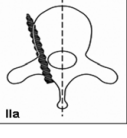
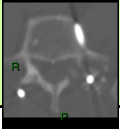
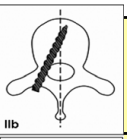
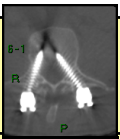
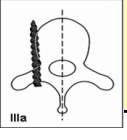
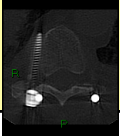
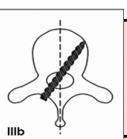
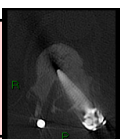


ZDICHAVSKY SCORING SYSTEM

Zdichavsky	Diagram	Example	Description
<i>Optimal</i>			
1a			≥ half of PSD within the pedicle & ≥ half of PSD within the vertebral body
<i>Acceptable</i>			
1b			> half of PSD lateral outside the pedicle & > half of PSD within the vertebral body
2a			≥ half of PSD within the pedicle & > half of PSD lateral outside the vertebral body
<i>Poor</i>			
2b			≥ half of PSD within the pedicle & tip of PS crossing the middle line of the vertebral body
3a			> half of PSD lateral outside the pedicle & > half of PSD lateral outside the vertebral body
<i>Very poor</i>			
3b			> half of PSD medial outside the pedicle & tip of PS crossing middle line of the vertebral body



ZDICHAVSKY SCORING SYSTEM

Zdichavsky	Diagram	Example	Open	Percutaneous	Fisher's Test
<i>Optimal</i>					
1a			283 85.5 %	87 88.8 %	$P = 0.50$
<i>Acceptable</i>					
1b			22 6.6 %	8 8.2 %	$P = 1.00$
2a			6 1.8 %	0	
<i>Poor</i>					
2b			6 1.8 %	2 2 %	$P = 0.59$
3a			11 3.3 %	1 1 %	
<i>Very poor</i>					
3b			3 0.9 %	0	$P = 1.00$
Total Pedicle Screws			331	98	



CONCLUSIONS

1. The accuracy of our open and percutaneous pedicle screw placement is comparable to that previously reported in the literature
2. Although the numbers do not reach significance, percutaneous pedicle screw insertion trends towards greater accuracy in our series when compared to the open techniques
3. Importantly, there were no percutaneous screws inserted with a very poor trajectory (Zdichavsky 3b)



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DECLARATION

No authors have any potential conflict of interest