

1 Threshold (Volts) From Pedicle Stimulation

CASE	AGE/ SEX	INDICATION FOR SURGERY	Lt. L1	Rt. L1	Lt. L2	Rt. L2	Lt. L3	Rt. L3	Lt. L4	Rt. L4	Lt. L5	Rt. L5	Lt. S1	Rt. S1
1	33M	Spondylolisthesis									20	23	24	30
2	18F	Tumor			>30	>30	>30		>30	>30				
3	44F	Postlaminectomy instability					>30	>30	>30	>30				
4	28F	Spondylolisthesis							86	27	7.6	20	17	14
5	49F	Postlaminectomy instability					44	>50	37	29	25	38.5	19	15
6	46F	Spondylolisthesis							35	17.4	35	27	5.8	14
7	56F	Pott's disease	40	23.6	45	32.5		35	25					
8	32M	Fracture	22	27.6		21	42	29						

Abbreviations: Lt. = left; Rt. = right; L = lumbar.

CASE 2

A 40-year-old woman presented with a 2-year history of left leg pain which followed an S1 distribution. She had previously undergone placement of L5-S1 bilateral pedicle fixation at another institution. She denied any symptoms of leg pain prior to the instrumentation procedure. Breach of the pedicle wall could not be confirmed preoperatively by CT scan, due to metallic artifact. Because of intractable pain, it was elected to remove the instrumentation. A technique identical to that described in Case 1 was utilized. A threshold of 3.2 volts was obtained upon stimulation of the left S1 pedicle screw.

The threshold for other screw placements was well above 5 volts. The patient's instrumentation was removed without difficulty. Postoperatively, the patient noted dramatic improvement in her left leg pain, which continued at 6-month follow-up.

DISCUSSION

In this report, we have described our early experience with a technique, which can potentially assist in proper localization of pedicle screws. We have utilized this technique for insertion of pedicle screws in eight patients resulting in 44 screw placements (Table 1). We have utilized this technique additionally in two patients, who underwent instrumentation procedures at other institutions. The two cases described in this report serve to verify the validity of this technique. In those patients who underwent instrumentation procedures at our institution, the stimulation thresholds were not below 5 volts in any of our screw placements. In none of those eight patients did we note the onset of radiculopathy during the postoperative period.

As more experience is gained, we hope that fu-

ture discussions will demonstrate the continued validity of this technique in a larger patient group.

REFERENCES

1. Calancie B, Lebowitz N, Madsen P. Intraoperative evoked EMG monitoring in an animal model: a new technique for evaluating pedicle screw placement. *Spine* 1992;17:1229-35.
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COMMENTARY

This technique may prove very useful in preventing complications associated with pedicle fixation.

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Utilizing experience gained from an animal model, the authors have applied that experience to clinical spine cases involving 44 pedicle screw placements in patients. The technique makes sense, intuitively. The thresholds for stimulation are similar to those used for stimulation of muscle during EMG testing, and the technique certainly seems worthwhile for improving screw localization clinically. The authors are to be congratulated on their contribution to improving the accuracy of placement of pedicle screws.

I believe this information will be of interest and use to the neurosurgical community.

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