Blood Loss Reduced During Surgical Correction of AIS with an Ultrasonic Bone Scalpel

Carrie E. Bartley, MA; Tracey P. Bastrom, MA; Peter O. Newton, MD

20th International Meeting on Advanced Spine Techniques (IMAST), Vancouver, Canada, July 2013.

Abstract

Summary

Using an ultrasonic bone scalpel to perform facetectomies and Ponte osteotomies when surgically treating AIS resulted in significantly less EBL than cuts made with standard osteotomes and rongeurs.

Introduction

Recently an ultrasonic powered bone cutting device has come onto the market with approval for use in the spine. Because the unit efficiently cuts bone, but spares soft tissues, it can be used to perform facetectomies (both inferior and superior articular process) and Ponte osteotomies in place of using standard osteotomes and rongeurs. We began using this device and perceived a reduction in bone bleeding associated with cut boney surfaces

Purpose

The purpose of this study was to evaluate the blood loss in adolescent idiopathic scoliosis (AIS) cases with and without the use of the bone scalpel to perform posterior Ponte releases.

Method

Single surgeon's cases. 60 Adolsecent Idiopathic Scoliosis patients treated with Posterior Spinal Fusion. 20 Bone Scalpel Group (Surgeon's first 20 cases). 2 control groups, 20 Most Recent cases prior to surgeon using bone scalpel, 20 Cobb Matched cases from prior to surgeon using bone scalpel. All patients underwent a Ponte release. Patients who underwent an anterior procedure were excluded. ANOVA was used to compare patient demographic and surgical info in the bone scalpel group to each control group.

Results

No differences were found between the Bone Scalpel group and either control group in terms of age, cobb, # levels fused, # levels released (Ponte osteotomies), or surgical time.

	BoneScalpel	Most Recent Controls	p-value	Cobb Matched Controls	p-value
Age (yrs)	15 ± 3	14 ± 2	0.671	14 ± 2	0.227
Thoracic Cobb (deg)	53 ± 9.5	51 ± 12	0.508	54 ± 9.6	0.869
Lumbar Cobb (deg)	38 ± 12	33 ± 14	0.251	35 ± 13	0.445
# of Levels Fused	11.5 ± 1.1	11.0 ± 2.0	0.547	11.3 ± 1.3	0.589
# Levels Released	5.5 ± 1.1	5.2 ± 1.6	0.499	5.5 ± 1.2	0.90
Surgical Time (min)	247 ± 62	233 ± 42	0.41	229 ± 30	0.25

The bone scalpel group had significantly less blood loss than both the most recent and Cobb matched control groups.

	BoneScalpel	Most Recent Controls	p-value	Cobb Matched Controls	p-value
EBL (cc)	550 ± 359	799 ± 376	0.039	886 ± 383	0.007
Cell Saver Transfused (cc)	94 ± 146	184 ± 122	0.042	198 ± 115	0.017
EBL/Levels Fused (cc)	48 ± 30	72 ± 28	0.01	78 ± 30	0.003
EBL/Levels Released (cc)	100 ± 50	163 ± 71	0.003	178 ± 30	0.009

Conclusion

The use of an ultrasonic bone scalpel to perform the bone cuts associated with facetectomies (both inferior and superior articular processes) and Ponte osteotomies results in significantly less bleeding compared to cuts made with standard osteotomes and rongeurs. With the use of the bone scalpel. the cut surfaces of the bone were “sealed” limiting overall blood loss by 30-40% as compared to the control groups.