44525 - SURFACE ANATOMY AS A GUIDE TO VERTEBRAL LEVEL FOR THORACIC EPIDURALS

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INTRODUCTION: Precise placement of thoracic epidural catheters is required to provide post-operative analgesia (1) with minimal adverse effects. Previous research shows that anesthesiologists are inaccurate when using surface anatomy to locate vertebral levels (2-5). This study compares the accuracy of two different landmarks to identify the T7 spinous process.

METHODS: The protocol received local ethics committee approval. Two hundred and ten patients referred for chest radiography gave consent and were randomized to two groups. With the patients in anatomic position, one investigator identified and labeled the presumed T7 spinous process using either C7 (prominens) or the scapular tip as a surface landmark. A radiologist, blinded to the identification technique, reported the spinous process corresponding to the radio-opaque label. Marker positions were then compared using the Fisher exact test. The impact of patient characteristics (age, gender, body mass index (BMI), height, weight) were then examined according to accuracy of landmarking method.

RESULTS: Patient characteristics were similar between groups. The T7 spinous process was identified correctly 29% of the time with the C7 landmark and 10% with the scapular landmark ($p<0.001$) (Table 1). Accuracy improved for T7 +/- 1 level to 78% and 42% respectively. Errors were more common in the caudal direction. The C7 landmark was more accurate among those with a BMI < 25. In those with a BMI ≥ 25 neither landmark resulted in high accuracy.

Table 1: Comparison of C7 to Scapular Tip for T7 Identification

Level	Method of Landmarking	
	C7 (N=106) n (%)	Scapular (N=104) n (%)
Thoracic vertebra:		
T5	1 (1)	-
T6	10 (10)	1 (1)
T7	31 (29)	10 (10)
T8	42 (40)	32 (31)
T9	19 (18)	38 (37)
T10	3 (3)	17 (16)
T11	-	6 (6)
Level		
Correct (T7)	31 (29)	10 (10) $p<0.001$
Incorrect (all others)	75 (71)	94 (90)
Level		
Correct (T7)	31 (29)	10 (10)
Err by 1 level	52 (49)	33 (32) $p<0.001$
Err by > 1 level	23 (22)	61 (59)

DISCUSSION: In the majority of cases, neither landmark identified T7 accurately. C7 gave more correct identifications than the scapular tip, unless the patient had an increased BMI where accuracy was low regardless of landmarking used. The C7 surface landmark is the more reliable surface landmark for thoracic epidural placement and is successful in 78% of determinations within one interspace.

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