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The impact of treatment modalities for minimally displaced clavicle fractures on scapular dyskinesia

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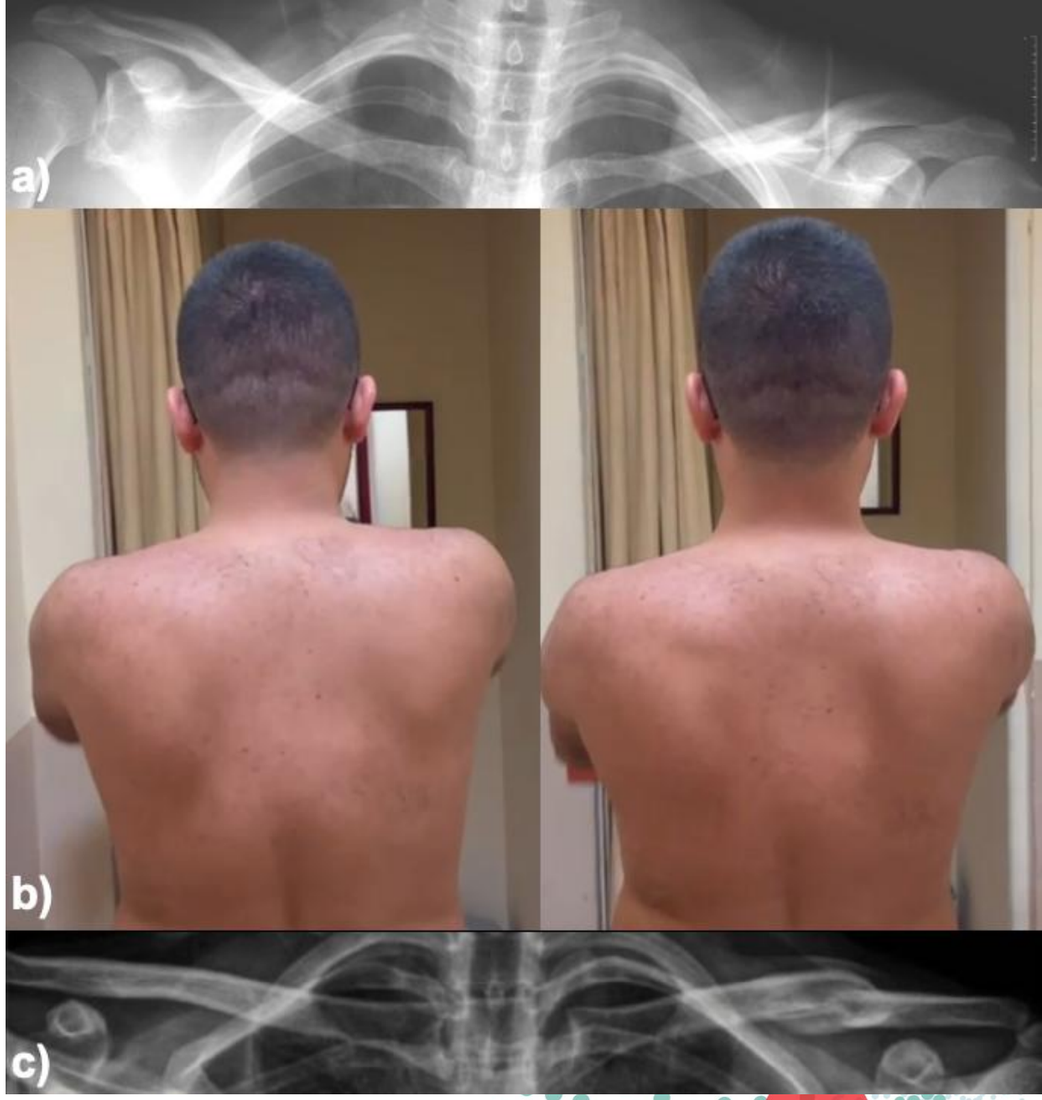
- Nothing to disclosure.

Purpose

Midshaft clavicle fractures are common and often associated with scapular dyskinesis (ScD), particularly in cases of shortening (1). While fractures with less than 2 cm shortening are often treated conservatively, emerging evidence suggests that even minor shortening can increase the risk of ScD and impair functional outcomes (2). This study investigates the impact of surgical versus conservative treatment on ScD and functional recovery.

Method

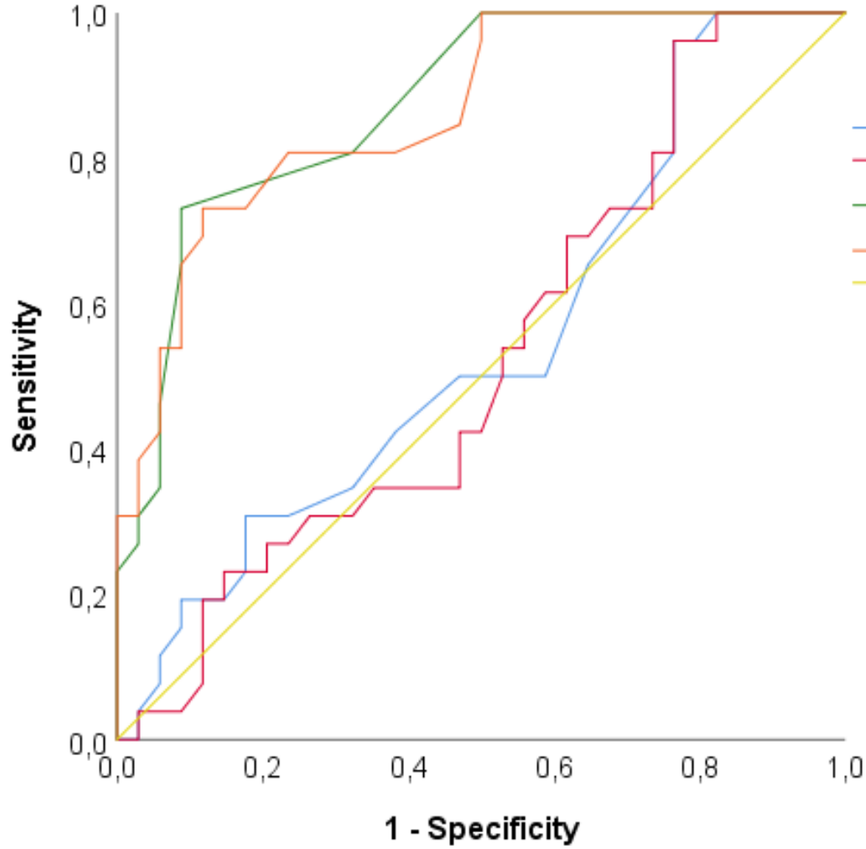
A retrospective analysis of 60 patients with isolated midshaft clavicle fractures was conducted. Patients were categorized into surgical and conservative groups. Fracture shortening was assessed using radiographs, outcomes were assessed using the SICK Scapula Rating Scale (3), Simple Shoulder Test (SST) (4), American Shoulder and Elbow Surgeons Scale (5) and Visual Analog Scale (VAS) (6). Logistic regression and ROC analysis was applied to identify ScD predictors, and critical shortening threshold.



Radiograph of a 30-year-old male patient who presented with left clavicle shaft fracture after a motor vehicle accident (a), clinical photograph and X-ray image of a patient who presented with left scapular dyskinesis after 4 years of follow-up following conservative treatment (b, c).

Results

ScD was observed in 43.3% of the all patients, with 53.6% of the conservative group, and 34.4% of the surgical group. Surgical treatment was associated with significantly better SST and VAS scores at the final follow-up (p <0.05). Logistic regression identified clavicular shortening (p <0.001) and lower BMI (p = 0.033) as significant predictors of ScD. ROC analysis revealed that a shortening threshold of 0.4 cm had a sensitivity of 73.08% and a specificity of 91.18% for predicting ScD (AUC = 0.874, p <0.001).



Receiver operating characteristic curve (ROC) for prediction for Scapular Dyskinesis

Results

Comparison of ASES, SST, VAS score changes and last follow up SICK Scapula scores according to treatment method

	Conservative Group		Surgical Group		Total		Test statistics	p
	Mean ± s. d.	Median (min. - max.)	Mean ± s. d.	Median (min. - max.)	Mean ± s. d.	Median (min. - max.)		
Change of ASES (last follow up-1. month)	13,18±4,00	13,00 (6,33 - 19,33)	12,63±4,45	13,34 (5,34 - 20,00)	12,89±4,22	13,00 (5,34 - 20,00)	409,500	0,568
Change of SST (last follow up -1. month)	1,64±0,91	2,00 (0,00 - 3,00)	1,56±1,01	1,00 (0,00 - 3,00)	1,60±0,96	1,50 (0,00 - 3,00)	420,000	0,664
Change of VAS (last follow up -1. month)	-1,04±1,50	-1,00 (-5,00 - 3,00)	-2,09±1,53	-2,00 (-6,00 - 0,00)	-1,60±1,60	-2,00 (-6,00 - 3,00)	278,500	**0,010**
SICK scapula last follow-up	4,00±1,94	4,00 (2,00 - 8,00)	3,19±1,96	2,50 (1,00 - 8,00)	3,57±1,98	3,00 (1,00 - 8,00)	328,000	0,068

Comparison of ASES, SST and VAS scores according to Scapular Dyskinesis

Scapular Dyskinesis	No		Yes		Test statistics	p*
	Mean± s.d.	Median (min. - max.)	Mean± s.d.	Median (min. - max.)		
ASES score 1. month	71,97±17,14	76,00 (35,00 - 93,00)	63,58±22,64	72,50 (27,00 - 94,00)	354	0,189
Last follow up ASES score	84,45±15,75	89,16 (50,00 - 100,00)	77,00±22,46	88,15 (40,00 - 100,00)	364,5	0,245
Test statistics	-5,088		-4,459			
p**	**<0,001**		**<0,001**			
SST score 1. month	9,32±1,47	9,00 (6,00 - 12,00)	8,62±1,53	8,50 (5,00 - 11,00)	320	0,063
Last follow up SST score	11,15±1,21	11,00 (8,00 - 14,00)	9,92±1,23	10,00 (8,00 - 12,00)	215	**0,001**
Test statistics	-5,004		-4,102			
p**	**<0,001**		**<0,001**			
1.month VAS score	3,79±1,72	3,50 (1,00 - 7,00)	3,46±1,58	4,00 (1,00 - 6,00)	400	0,525
Last follow up VAS score	1,88±1,23	1,00 (1,00 - 5,00)	2,27±1,28	2,00 (1,00 - 5,00)	345,5	0,126
Test statistics	-4,412		-2,987			
p**	**<0,001**		**0,003**			

*Mann-Whitney U test, **Wilcoxon test

Conclusion

Surgical treatment reduced the prevalence of ScD and facilitated better functional outcomes through early mobilization and anatomical alignment. These findings suggest surgical treatment may benefit patients even in minimally displaced fractures, highlighting the importance of individualized treatment strategies.

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