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CLINICAL ANALYSIS OF HERBERT SCREW FIXATION TECHNIQUES IN SCAPHOID FRACTURE MANAGEMENT: A CASE SERIES

Orthopaedics

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ABSTRACT

This case series was taken to assess the results of Herbert screw fixation in patients with scaphoid fractures. Description of surgical technique, healing process, and recovery of function at best and worst ends of the spectrum. The findings of the study were that Herbert screw fixation is quite effective for the treatment of scaphoid fracture with a high rate of bone union and functional recovery. This series justifies the use of this technique as an ideal surgical option only if the best results are to be achieved by careful patient selection and precise surgical execution.

KEYWORDS

INTRODUCTION

Scaphoid fractures are common; however, the challenges come as a result of the complex geometry of the fracture combined with the fragile blood supply. Inadequate diagnosis and management of acute scaphoid fractures put patients at a very high risk for non-union, typically resulting in degenerative wrist arthritis. Better diagnostic tools, surgical techniques, and new implant materials have increased the application of early internal fixation in even nondisplaced fractures that otherwise would have been managed nonoperatively. However, with the introduction of new techniques of fixation, both open and percutaneous, the nonunion rate post-surgery remains up to 10% for scaphoid fractures. Scaphoid nonunions may occur with or without avascular necrosis of the proximal pole and may have a humpback deformity on radiographs. If left untreated, these nonunions can result in carpal collapse with degenerative arthritis. On the other hand, surgical intervention incorporates the correction of deformity with open reduction and internal fixation.

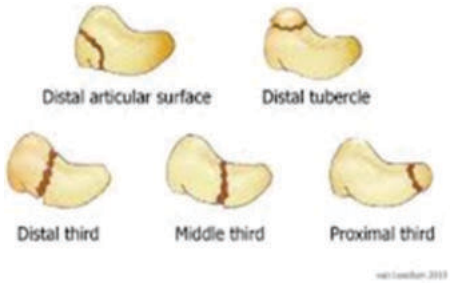
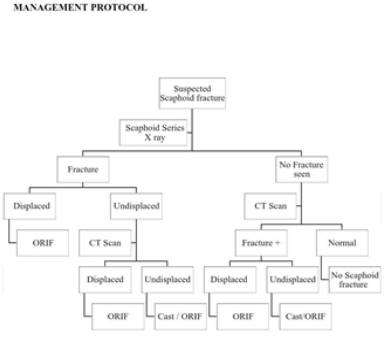


Figure 1 types of scaphoid fracture



MATERIALS AND METHODS:

Place Of Study: Sree Balaji Medical College, chennai
Study Design : Retrospective case series.

"Inclusion criteria :

- Patient more than 18 years of age
- Patients with acute scaphoid fractures treated with Herbert screw fixation over a one year period.
- Displaced distal pole and waist fractures of scaphoid
- Proximal pole fracture of fracture

Exclusion criteria

- Pathological fractures
- Previous scaphoid surgery
- Inadequate follow-up.
- Patients less than 18 years of age

Sample size: Three

Data Collection: Demographic data, fracture characteristics, surgical details, and outcomes were recorded. Follow-up assessments included radiographic evaluations and clinical examinations usingv modified mayo score.

MODIFIED MAYO WRIST SCORING CHART

CATEGORY	SCORE	FINDINGS
PAIN (25 points)	25	No Pain
	20	Mild pain with vigorous activities
	15	Moderate pain with vigorous activities
	10	Mild pain with ADL
	5	Moderate pain with ADL
	0	Pain at rest
SATISFACTION (25 points)	25	Very satisfied
	20	Moderately satisfied
	10	Not satisfied but working
	0	Not satisfied, unable to work
RANGE OF MOTION (25 points) (% of normal)	25	100
	15	75-99
	10	50-74
	5	25-49
	0	0-24
GRIP STRENGTH (25 points) (% of normal)	25	100
	15	75-99
	10	50-74
	5	25-49
	0	0-24

MODIFIED MAYO WRIST SCORING CHART [10]		
FINAL RESULT	90-100	Excellent
	80-89	Good
	65-70	Fair
	<65	Poor

Cases

Case 1: Non-Union of Scaphoid Fracture

- **Patient:** 37-year-old male, history of scaphoid fracture one and half year back. Underwent native treatment
- **Fracture Type:** Non-union of mid-waist fracture.
- **Surgical Technique**: Open reduction, internal fixation with 2 Herbert screw,
- **Outcome:** Radiographic union at 12 weeks. Improved wrist function, though slight pain persists with heavy lifting.
- **Complications:** None.

Figure 1 scaphoid view of left wrist

Figure 2 ap view of left wrist

Figure 3 post op x ray ap vie

Figure 4 post op x ray lateral view

Case 2: Proximal Pole Scaphoid Fracture

- **Patient:** 30-year-old female, presented with wrist pain following a car accident.
- **Fracture Type:** Proximal pole scaphoid fracture.
- **Surgical Technique:** Open reduction and internal fixation with a Herbert screw.
- **Outcome:** Delayed union, achieved radiographic healing at 16 weeks. Mild reduction in wrist extension, managed with physiotherapy.
- **Complications:** Transient numbness in the thumb, resolved within 4 weeks.

Figure 5 x ray ap view

Figure 6 post op x ray ap view

Figure 7 post op x ray lateral view

Figure 8 range of motion

Case 3: Acute Mid-Waist Scaphoid Fracture

- **Patient:** 39-year-old male, presented after a fall on an outstretched hand.
- **Fracture type:** Transverse fracture through the waist of the scaphoid
- **Surgical Technique:** Percutaneous Herbert screw fixation.
- **Outcome:** Radiographic union at 8 weeks. Full wrist function and return to sports at 12 weeks.

Complications: None

Figure 9 x ray ap view

Figure 10 post op x ray lateral view

Figure 11 range of motion

Fracture Type	Number of cases	Approach		result	%
		Volar	Dorsal		
Non union of proximal pole	1	1	0	good	80
Proximal Pole fracture	1	1	0	excellent	90
Mid waist fracture	1	01	0	fair	70
Total	03	03	0		

DISCUSSION

"Scaphoid fractures are very common but often elude diagnosis and optimal treatment. These fractures may be associated with long-term disability and loss of work time, especially in young adults where they occur most frequently. McLaughlin, Maudsley, and Chen recommended open reduction and internal fixation using compression lag screws for the early mobilization of the wrist. Herbert and Fischer first described this technique back in 1984, and soon after that, the Herbert screw became widely adopted for the management of scaphoid fractures. Rettig ME et al. treated 14 consecutive patients with an acute displaced scaphoid waist fracture using open reduction and internal fixation with the Herbert screw and K-wires through a volar or dorsal approach. Of these, eight were treated with Herbert screw fixation, and 13 (93%) of 14 united within 11.5 weeks (range 8-20 weeks) with good functional results. Non-displaced stable scaphoid fractures of the distal and middle third were treated conservatively.

Saeden B et al. in a prospective series of 61 patients with 62 acute scaphoid fractures compared Herbert screw fixation to short arm cast treatment. They showed an earlier return to work in the surgical group for which reason surgical fixation of these fractures is becoming increasingly popular.

The Herbert screw can be inserted using a palmar or dorsal approach. The palmar approach is suitable for waist and distal pole fractures, and it preserves the vital dorsal blood supply; however, it disrupts the volar carpal ligaments and exposes little at the proximal pole. The dorsal approach is associated with good access to the proximal pole, but the fragile blood supply may be compromised.

CONCLUSION

Herbert screw fixation is successful in treating scaphoid fractures with high rates of union and functional recovery. This case series supports its use as a surgical approach preferred by many surgeons, with careful patient selection and precise surgical technique being essential for optimal outcomes with Herbert screw fixation"[5,6].

REFERENCES

1. Mclaughin HL Fracture of the carpal navicular (scaphoid) bone: some observation based on treatment by open reduction and internal fixation. J. Bone Joint Surg [Am] 1954;36-A:765-74
2. Maudsley RH, Chen SC. Screw fixation in the management of the fractured carpal scaphoid. J. Bone Joint Surg [Br] 1972;54-B:432-41
3. Herbert TJ. Use of Herbert Bone screw in surgery of the wrist. Clin orthop 1986;(202):79-92.
4. Rettig ME, Kozin SH, Cooney WP. Open reduction and internal fixation of acute displaced scaphoid waist fractures. J Hand Surg 2001;26A:271-6.

5. Saeden B, Tornkvist H, Ponzer S, Hoglund M. Fracture of the carpal scaphoid; a prospective randomized 12 year follow up comparing operative and conservative treatment. J. Bone Joint Surg 2001;83B(2):230-4.
6. Kawamura K, Chung KC. Treatment of scaphoid fractures and nonunions. J.Hand Surg 2008;33A:988-97
7. Chung KC. simplified approach for unstable scaphoid fracture fixation using the Acutrak screw. Plast Reconstr Surg 2002;110:1697–1703 11
8. Naranje S, Kotwal PP, Shamshery P, Gupta V, Nag HL. Percutaneous fixation of selected scaphoid fractures by dorsal approach. International orthopedics 2010;34:997-1003.
9. Shin AY,Hofmeister LCDR EP, MC,USN. Volar percutaneous fixation of stable scaphoid fractures. Atlas Hand Clin 2003;8:19-28
10. Bedi A, Jebson PJ, Hayden RJ, Jacobson JA, Martus JE. Internal fixation of Acute nondiplaced scaphoid waist fractures via a limited Dorsal approach; An assessment of Radiographic and functional outcomes. J. Hand Surg 2007;32A:326e1-e9.