Fragment Specific Fixation technique using 2.7 mm VA LCP for Comminuted Posterior Wall Acetabular Fractures: a novel surgical technique

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All devices in this study has FDA approval / This study has no financial disclosure

Purpose of study

- Propose the novel technique of fragment-specific fixation technique using multiple 2.7-mm variable-angle locking compression plates (VA LCPs) in comminuted posterior wall acetabular fractures and reported its preliminary results

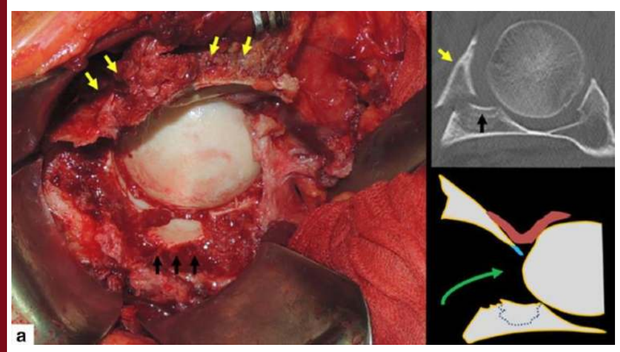
Patients and Methods

- Retrospective case series from 2013 to 2017
- Two orthopaedic trauma surgeons, Single surgical technique “Fragment Specific Fixation technique”
- 23 patients with comminuted posterior wall fracture in acetabulum
  - ✓ 3 ≥ fragments in the CT scan
  - ✓ No column involvement
  - ✓ Minimum follow-up duration of 12 months
  - ✓ Involvement of superior acetabular dome
  - ✓ Marginal impaction or incarcerated fracture fragment

Surgical technique

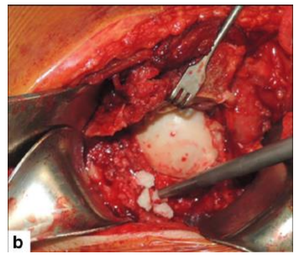
✓ Approach

- Kocher-Langenbeck approach in lateral position
- The margins of the acetabular socket were carefully examined to assess marginal impaction

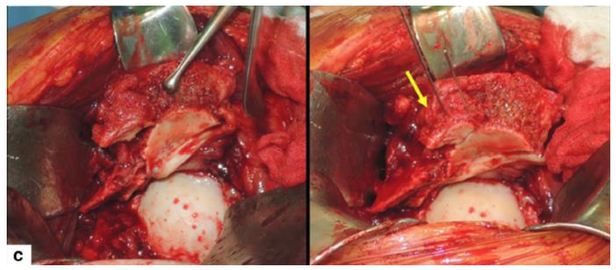


✓ Reduction and fixation

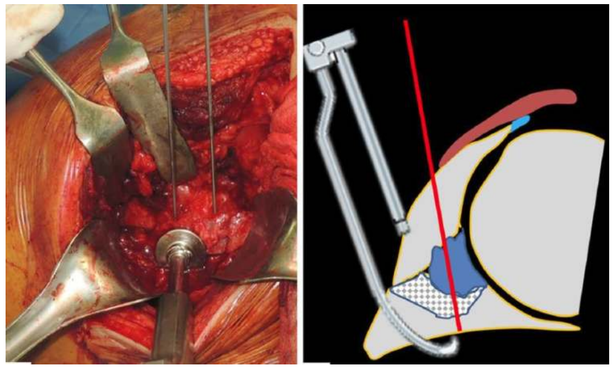
- Allograft cancellous chip bones were packed into the defect created under the elevated marginal impaction



- Any step-off between the articular fragments was reduced under direct visualization and stabilized using either mini-screws or fine K-wires

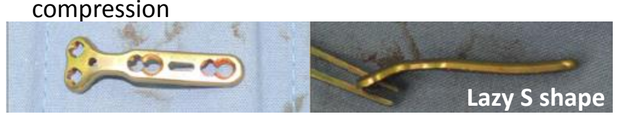


- A collinear clamp was used for compression and final reduction
- Attempted to place K-wires on each major articular fragment starting from the lateral margin of the wall fragment to the posterior column

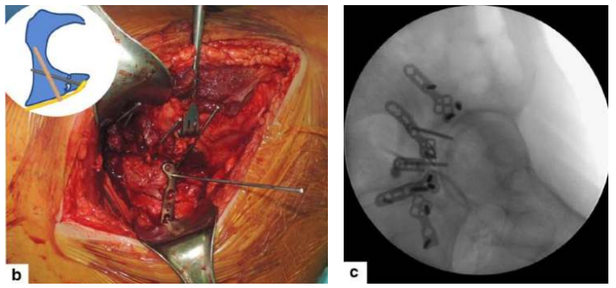


✓ Choice and contouring of Implant

- T clover leaf or 2-hole T-shaped 2.7-mm VA LCPs from the VA foot set (DePuy Synthes, USA) surfaced as the primary choice
- Underbent at the shaft to buttress the wall fragment and overbent at the neck to maximize the compression

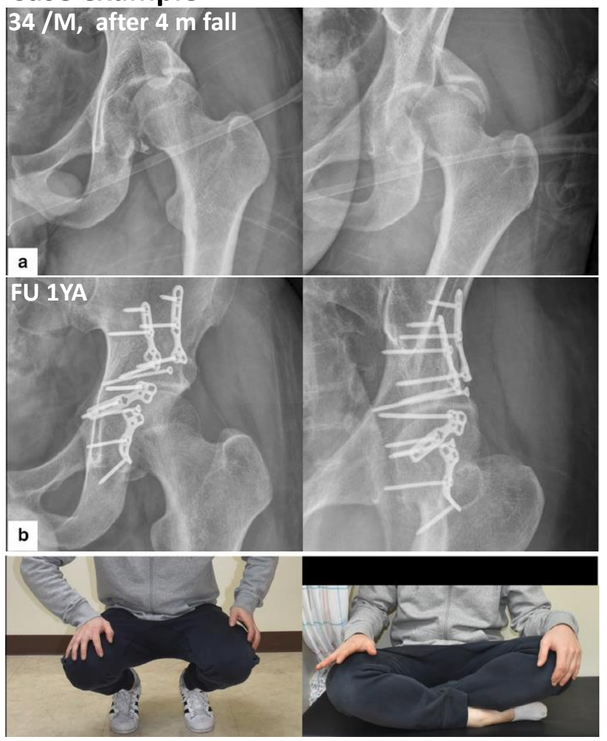


✓ Plate orientation and fixation construct



- Radial to the articular margin of the wall fragments
- One or two positioning screws near the joint
- Buttress plating separately

Case example



Clinical Results

Demographics	23 patients
Age, yrs, average (range)	48 (23-69)
Sex (M:F)	19:4
Hip Dislocation, n, %	16 (69.5%)
PW Fracture characteristic	
Average number of fracture fragment	3.4
Marginal impaction, n, %	10 (43%)
Incarcerated fragment	7 (30%)
Superior acetabular dome invol.	8 (35%)
Surgical details	
Approaches	All K-L
Number of plates, average	3.5
Position of plates	
Transverse (radial)	15
Oblique	2
Combined	6
Operation time, min, average	200
Quality of reduction	
Anatomical (0-1mm displacement)	18
Imperfect (2-3mm displacement)	5
Follow up outcomes	
Follow up duration, month, average	26.8
Bony union (%) & union time (weeks)	22(96%)12wk
Complications	
Acute postoperative infection	1
AVN, HO, LOR, Sciatic nerve palsy	0
Functional outcome	
Excellent, n (%)	6 (27%)
Very good, n (%)	14(64%)
Good, n (%)	2(9%)

Conclusion

The fragment-specific fixation technique using 2.7-mm VA LCPs can be **a possible alternative** to the classical 3.5-mm lag fixation or spring plate fixation augmented with 3.5-mm reconstruction plate fixation, **especially for superior dome involvements or multifragmentary posterior wall fractures**