

TECHNICAL CHALLENGES AND SHORT TERM OUTCOME OF CANNULATED SCREW FIXATION OF PELVIC RING AND ACETABULAR FRACTURES

Jeffrey S, Mohd Ashraf AM, Rostam M, Fikry MI, Esanikarupiah J, Bryan Teoh CE, Nur Atiqah MJ, Abdullah Aqeel M, Saravanan A, Mohd Naim N, Kamarul Al-Haqq AG
Orthopaedic and Traumatology Department, Hospital Tengku Ampuan Rahimah

INTRODUCTION:

Cannulated screw fixation(CSF) is an alternative method of fixation for pelvic ring and acetabular fractures¹. We would like to share our experience and outcome with this new fixation technique.

METHODS:

In this case series, patients with closed pelvic ring and acetabular fractures who underwent CSF at our centre between January 2017 and December 2018 were analyzed for their postoperative complications and radiological outcomes.

RESULTS:

22 patients were selected. Most patients were male who had a motorvehicle accident. 23 acetabular column, 7 iliac wing(IW) and 1 superior pubic rami(SPR) fractures underwent CSF. All 16 anterior column(AC) fractures were fixed with a single screw, 13 of which were placed in a retrograde direction and 11 done percutaneously. 3 AC fractures had imperfect reduction, 2 had step deformity and 1 fixation had to be revised. All 7 posterior column(PC) fractures CSF were done using a limited open antegrade approach. None had any post fixation fracture malreduction or complications. All IW and SPR fractures fixation were done via a percutaneous retrograde method. 1 IW and SPR fracture CSF had imperfect reduction.

DISCUSSIONS:

CSF of the pelvic ring and acetabular fractures provides limited soft tissue disruption, less blood loss, shorter surgery time and fewer complications compared to the standard plate fixation¹. CSF is recommended for non-displaced fractures and in obese, osteoporotic or elderly patients but has a steep learning curve¹. In CSF, the fracture is first reduced using manual traction maneuver or direct reduction through a limited open approach before the screw is placed through a narrow pelvic corridor across and perpendicular to the fracture site¹. Continuous proprioceptive feedback and appropriate imaging views used during guidewire placement in CSF prevented us from injuring the surrounding structures. Furthermore, PC fractures

Table 1 showing CSF technique and outcome

Variables (n=31)	Acetabulum fracture (n=23)		Iliac wing fracture (n=7)	Sup pubic rami fracture (n=1)
	Ant column	Post column		
Age (Yr)	33+/-11		29+/-8	35
BMI (kg/m ²)	23.2		22.3	25.7
Acetabular Frac.				
Elementary frac.	12	3	-	-
Associated frac				
Both Column		4	-	-
Iliac wing frac	-	-	7	-
Sup pub rami frac	-	-	-	1
Screw placement				
1.Antegrade				
Limited open	3	7	0	0
Percutaneous	0	0	0	0
2.Retrograde				
Limited open	2	0	0	0
Percutaneous	11	0	7	1
No of screws				
Single	16	6	3	1
Two screws	0	1	4	0
Step off				
No step off	14	7	7	0
2 mm	2	0	0	1
Matta reduction				
Anatomical	13	7	6	0
Imperfect	3	0	1	1
Poor	0	0	0	0
Complications				
Joint penetration	0	0	0	0
Revision	1	0	0	0
Neurovasc. injury	0	0	0	0

were not fixed retrogradely to avoid sciatic nerve injury. The 7.3mm cannulated screws used, fit well within all pelvic corridor¹. We noted that limited fracture site exposure in the percutaneous approach was accountable for all the imperfect reduction. Mismatch between screw trajectory and pubic rami curvature had caused the SPR malreduction whilst single screw fixation was insufficient to compress IW fractures. CSF not perpendicular to the fracture line had caused all the step deformity seen. 1 CSF revision was done due to prominent implant.

CONCLUSION:

Cannulated screw fixation has its advantages but requires precise planning to avoid its complications.

REFERENCES:

1. P.V. Giannoudis et al.Percutaneous fixation of pelvic ring. JBJS (Br) Vol 89-B, No. 2 Feb 2007.