



"STUDY OF UNSTABLE FRACTURE OF PELVIC IN CHILDREN"

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ABSTRACT

Background: Unstable fractures of the pelvic ring in children are usually treated conservatively, Out of all fractures the pelvic fracture showed relatively less which account for 3%. In children Pelvic fractures are relatively rare as less than 0.2% of all paediatric fractures and 1-5% of admissions to tertiary children's health centre. Pelvis is a structure like a basin shaped bony which supports the spinal column and protects the abdominal organs. It may be fracture due to high energy forces such as fall from a height or motor vehicle crash. Incident of pelvic fracture is increasing and these are associated with a high mortality rate of 25%. There was relatively low rate of occurrence of fracture of pelvic injuries that associated with high levels of morbidity and mortality. According to the studied of the post-mortem examined only in children 66 deaths caused by trauma that showing pelvic fracture and severe bleeding to be the cause of death in 42% of the cases

Material And Methods: This study total 10 children patients were included who had suffered unstable fractures of the pelvic ring. From all the patients detail clinical history were taken with analysis of the pre and postoperative radiographs by presence of the triradiate cartilage of the iliac. This study was based on radiographic quantification and the outcome of the residual pelvic and after the surgery treatment using the method of Keshishyan et al for comparison of pre and post operative findings.

Result: This study unstable fractures of the pelvic ring evaluated where female were 7 and male were 3 with the ration 7: 3. The ranges were 2 to 13 years with the mean age 7.2 years old. For all the patients operation was done on an average of 12.3 days after the fracture. The maximum cases the initial trauma were due to the run over followed by motorcycle accident and fall from height respectively. The injuries of the pelvis joint were divided into anterior and posterior. Symphysis disjunction of the pubic fracture were present in maximum with the fracture of two rami and fracture of four rami respectively. In five of the cases Sacroiliac dislocation correspond to posterior lesion were seen.

Conclusion: children fracture of pelvic ring is rare and an indication for surgical treatment is unusual. Their concerns relate to the complications encountered that in leg length and residual pain in the sacroiliac joint. Hence for the justification, this study finding provides justifies the option of surgical treatment for reduction and correction of pelvic deformities, of the pelvic ring at an early stage, at the time of the injury.

KEYWORDS : unstable pelvic fracture, pelvic ring, paediatric, child.

INTRODUCTION:

Pelvic fractures in children are rare and often the result of high energy trauma, Out of all fractures the pelvic fracture showed relatively less which account for 3%. In children Pelvic fractures are relatively rare as less than 0.2% of all paediatric fractures and 1-5% of admissions to tertiary children's health centre. These fractures are generally caused by high- energy trauma, high-impact accidents and are often associated with injuries to other organic lesions like abdominal viscera, genitourinary system, neurovascular, musculoskeletal structures and central nervous system.

Pelvis is a structure like a basin shaped bony which supports the spinal column and protects the abdominal organs. It may be fracture due to high energy forces such as fall from a height or motor vehicle crash. Incident of pelvic fracture is increasing and these are associated with a high mortality rate of 25%. There was relatively low rate of occurrence of fracture of pelvic injuries that associated with high levels of morbidity and mortality.

According to the studied of the post-mortem examined only in children 66 deaths caused by trauma that showing pelvic fracture and severe bleeding to be the cause of death in 42% of the cases. One of the studied showed that in 95 children suffering from pelvic fractures, locomotion capacity and dependence was assessed which showed that 80% of patients had unstable fractures and 52% of patients with stable fractures were dependent on help for locomotion*. When involving emergency situation cases with hemodynamic

instability immediate treatment must be conducted using an external fixation, though it is only for temporarily to prioritise controlling the bleeding and saving the patient's life²³. In cases with dislocation of the sacroiliac joint an anterior external fixator alone will not be sufficient to reduce and stabilise the posterior ring.

The main objective of this study is to study the surgical treatment for unstable pelvic fractures in children and stabilisation on basic primary care provided at an emergency service.

MATERIAL AND METHODS:

This study was retrospective study carried out in the Dept. of orthopedics at Darbhanga medical college and Hospital Laheriasarai Bihar. In this study total 10 children patients were included who had suffered unstable fractures of the pelvic ring and had undergone surgical treatment in this institution during the period of 1 year. From all the patients detail clinical history were taken with analysis of the pre and postoperative radiographs by presence of the triradiate cartilage of the iliac. This study was based on radiographic quantification and the outcome of the residual pelvic and after the surgery treatment using the method of Keshishyan et al for comparison of pre and post operative findings.

RESULT:

This study total 10 patients were included with unstable fractures of the pelvic ring evaluated where female were 7 and male were 3 with the ration 7: 3. The age ranges were 2 to 13 years with the mean age 7.2 years old. For all the patients

operation was done on an average of 12.3 days after the fracture. In this study the maximum cases the initial trauma was due to the run over followed by motorcycle accident and fall from height respectively.

The injuries of the pelvis joint were divided into anterior and posterior. Symphysis disjunction of the pubic fracture were present in maximum with the fracture of two rami and fracture of four rami respectively. In five of the cases Sacroiliac dislocation correspond to posterior lesion were seen. Unilateral fracture of the posterior ilium were also seen whereas unilateral anterior opening of the sacroiliac joint was also present.

The AO-OTA classification was used to evaluate the cases with the following distribution. 61 B1 (one case); 61 B2 (one case); 61 C3 (one cases), 61 C2 (one case) and 61 C1 (seven cases) as shown in the table no 1 below.

For all the patients primary health care were provided before reached to our medical college and hospital after clinical stabilization was achieved. Six patients were suffered from other associated injuries as one with a clavicle fracture was treated without surgery using external immobilisation.

Two with a fracture of the proximal humerus and fractures of the bones of the lower leg is ilateral to the pelvic lesion, one with the upper limb was treated conservatively and the tibia was fixed with flexible intramedullary nails. One with olecranon who suffered a fall was fixed using a tension band and one with concomitant injury to the bladder, diagnosed using exploratory laparotomy during primary care.

Table 1: Showing The Patients Data With Clinical Presentation

S.N.	Age (yrs)	sex	AO-OTA classification	posterior lesion	anterior lesion	cause of accident
1	2	F	61C1	Sacroiliac dislocation	Disjunction of symphysis	Run over
2	12	F	61C1	Sacroiliac dislocation	Fracture of two rami	Motorcycle accident
3	5	M	61B1	Anterior sacroiliac opening	Fracture of two rami	Run over
4	5	F	61B2	Sacroiliac dislocation	Disjunction of symphysis	Run over
5	9	M	61C1	Sacroiliac dislocation	Disjunction of symphysis	Run over
6	10	F	61C1	Sacroiliac dislocation	Disjunction of symphysis	Run over
7	13	F	61C2	Sacroiliac dislocation + anterior compression (bilateral)		Motorcycle accident
8	6	M	61C1	Sacroiliac dislocation	Fracture of two rami	Run over
9	3	F	61C3	Sacroiliac dislocation (bilateral)	Fracture of four rami	Run over
10	7	F	61C1	Sacroiliac dislocation	Disjunction of symphysis	Fall from height

In the radiographic evaluation, pelvic asymmetry before the surgical procedure ranged from 0.7 to 2.8 cm (mean of 1.46 cm), and fall the range to 0.2 to 0.9 cm (mean 0.4 cm) after the reduction as shown in table no 2 below. The follow-up period

for the patients in the hospital was ranged from 210 to 1,896 days.

Table 2: Showing The Result From Surgery Treatment

S. N.	Surgery performed	Preoperative pelvic asymmetry(cm)	Postoperative pelvic asymmetry (cm)	Preoperative deformity index (Keshishyan)	Postoperative deformity index (Keshishyan)
1	Symphysis plate + sacroiliac screw	1.7	0.2	0.3	0.02
2	External fixator + sacroiliac screw	0.7	0.3	0.05	0.02
3	External fixator + sacroiliac screw	1.8	0.3	0.17	0.04
4	External fixator + sacroiliac screw	1.1	0.5	0.2	0.04
5	External fixator + sacroiliac screw	1.2	0.3	0.1	0.03
6	External fixator + sacroiliac screw	1.6	0.5	0.1	0.05
7	External fixator + sacroiliac screw	2.8	0.9	0.15	0.08
8	External fixator + sacroiliac screw	0.9	0.2	0.12	0.05
9	External fixator + sacroiliac screw	1.5	0.5	0.07	0.03
10	External fixator + sacroiliac screw	1.2	0.2	0.08	0.03

anterior injury was a fracture of four rami and posterior was a bilateral sacroiliac dislocation.

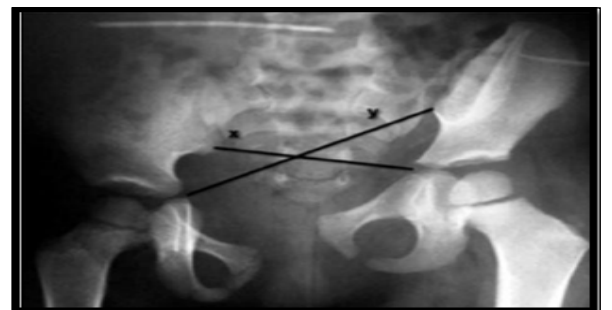


Figure 1: Keshishyan et al. [1] method of measuring pelvic obliquity, where the pelvic asymmetry is the difference in length between the diagonals (X – Y cm). The degree of deformity corresponds to the difference in the diagonals (X – Y cm) divided by the sum of the diagonals (X + Y cm).

DISCUSSION:

In children unstable pelvic fractures are relatively rare which are caused by high-impact traumas. In comparison to adults; in children Pelvic injuries are accompanied by various organ injuries that are associated with high morbidity and mortality. In this study run over on public roads was main cause. The profile of the children was reported to be literature excepted for the distribution according to sex.



Figure 3: postoperative X-ray, AP view showing the final result.

However, most frequently lesion occur in male gender but whereas in this study maximum cases were female almost 70 %. In this study run over on public roads was the most frequent cause of the fracture that was agree with the studied done by Signorino et al who reported as commonest causes were being run over and traffic accidents. There are many studied which have analyzed the long-term evolution of unstable and stable lesions of the pelvic ring that were treated conservatively. Studied of Schwarz et al. showed that 47% rate of poor results due to pelvic asymmetry; which underline the importance of achieving anatomical reduction and conclude that unstable pelvic fractures. Several studies presented long-term progression of unstable fractures of the pelvic ring that were treated non-surgically and evolved with unsatisfactory results, with residual pain in the posterior region of pelvis which is due to residual pelvic asymmetry.

In this study showed the limitation with the sample size this is because of the rare fracture that affects around one in 100,000 children per year and we believe sample is relevant, since no large published series on surgical treatment for this lesion exist. The result of this study helps to encourage continue to indicate surgical treatment for cases in which there is pelvic asymmetry greater than 0.5 cm when there is present of associated dislocation of the sacroiliac joint, that would be unlikely to evolve satisfactorily without surgical measures.

CONCLUSION:

In children fracture of pelvic ring is rare and an indication for surgical treatment is unusual. There are many research which still have a controversy for treatment, which has been recommended for treating these fractures for many years. Their concerns relate to the complications encountered that in leg length and residual pain in the sacroiliac joint.

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