



Single right sided traumatic avulsion fracture of both ASIS and AIIS: case review

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Introduction and importance: Simultaneous avulsion fractures of the anterior superior iliac spine (ASIS) and anterior inferior iliac spine (AIIS) are rare, typically resulting from intense muscular contractions in athletes. Accurate diagnosis requires thorough examination and imaging.

Case presentation: A 29-year-old male sustained right-sided ASIS and AIIS avulsion fractures from a road traffic accident. Diagnosis was confirmed via plain radiographs and 3D CT scans. The patient underwent surgical fixation with cannulated cancellous screws. He fully recovered and resumed pre-injury sports activity within 5 months.

Clinical discussion: ASIS and AIIS avulsion fractures are uncommon, with simultaneous occurrences being even rarer. Proper diagnosis and surgical intervention are crucial, especially in active patients with significant displacement.

Conclusion: Surgical treatment using cannulated cancellous screws led to complete recovery and return to sports activity in this case, highlighting the effectiveness of this approach for managing complex avulsion fractures.

Keywords: anterior superior iliac spine, anterior inferior iliac spine, fracture-avulsion, trauma sport injury

Introduction and importance

Avulsion fracture of the pelvic apophysis in adolescent athletes is an uncommon as a result of intense strain from a strong, abrupt muscular contraction. The majority of these injuries are misdiagnosed as strains^[1]. Therefore, a carefully taken history and physical examination with radiographic confirmation are needed for exact diagnosis. The majority of studies on ASIS and AIIS fractures focus on adolescents, making this case a unique contribution to the existing literature on adult pelvic injuries^[2]. The purpose is to present an unusual case, contribute to the literature on pelvic apophysis injuries in adults, and discuss the treatment approach, emphasizing the efficacy of surgical fixation. We report a case Single Right Sided Traumatic Avulsion of both ASIS and AIIS in a young adult. This case has been reported in line with the SCARE 2023 criteria^[3].

Case presentation

A 29-year-old male presented to the emergency department as referred case from a local hospital after primary management with pain over right hip, right knee, right ankle and right lower limb was unable to bear weight or walk following RTA. The patient being bike rider sustained collision with car and had fall injury with impact over right side of body. The patient revealed no significant past medical history and surgical history. There was no known allergies. Family history was also not significant. He

HIGHLIGHTS

- Simultaneous anterior superior iliac spine (ASIS) and anterior inferior iliac spine (AIIS) avulsion fracture is rare.
- Sartorius and tensor fascia lata contractions against a hyper-extended hip are the typical mechanism for ASIS avulsion.
- The mechanism underlying AIIS avulsion is a sudden or uncontrollably powerful contraction of the rectus femoris muscle combined with a forceful combination of hip extension and knee flexion.
- Open reduction and fixation with a cannulated cancellous screws is a reliable and solid technique allowing a complete and rapid recovery of the level of sports activity.

does not smoke and consume alcohol. General and systemic examination was unremarkable. Local examination revealed tenderness over right iliac region with restricted and painful ROM of hip joint, lacerated injury approximately 20*10 cm over antero-medial aspect of knee joint. Posterior tibial dorsal pedis artery is palpable and neurology is intact.

Plain radiographs (Fig. 1) of the pelvis found avulsion of the right anterior superior iliac spine (ASIS) and right inferior iliac spine. The radiographic imaging was confirmed by a 3D CT scan (Fig. 2) that showed an avulsion fracture of the right ASIS and right inferior iliac spine such that fracture line extended from the anterior portion of the acetabulum to the anterior aspect of the iliac crest. CT scan findings confirmed fracture

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Figure 1. Plain X-ray of the pelvis showing Single right sided avulsion fracture of both ASIS and AIIS.

lines originating from muscular attachment points, consistent with avulsion fractures caused by sartorius and rectus femoris muscle forces. The displacement was 10.3 mm (Fig. 3).

After the pre-operative evaluation and medical review of the patient and under general anaesthesia, Patient was treated surgically for with fracture reduced and maintained with cannulated cancellous screws (CCS) placed with the help of guide wire under C-arm guidance using skin incision along tip of ASIS toward patella about 10 cm from ASIS.

The patient was discharged after 17 days of hospital stay. The patient was advised for non-weight bearing for 14 days. The patient was advised for follow up after 4–6 weeks or as needed.

The follow up after 5 months at the hospital shows sign of healing on X-ray (Fig. 4) and the patient is doing daily activities

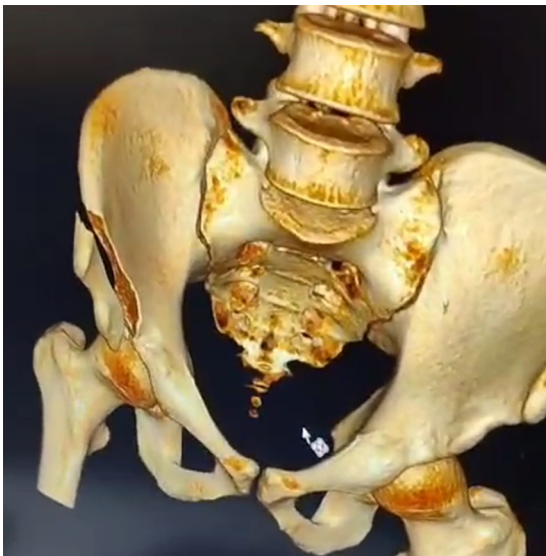


Figure 2. 3D CT scan of the pelvis showing Single right sided avulsion fracture of both ASIS and AIIS.



Figure 3. CT scan showing displacement of 10.3 mm.

very easily and there is Full range of hip motion. There were no complications. The outcome of the patient was as expected.

Clinical discussion

Comprehensive assessment and clear documentation of injuries and management are done. Coordination between emergency, orthopedic surgery, and radiology departments was done to give optimum care. The structure and biomechanics of the pelvis are extremely complicated and fluctuate with age^[4]. Avulsion fractures of pelvic apophyses are uncommon^[5]. In the pelvis, the Ischial tuberosity avulsion is the commonest. Ischial tuberosity avulsion fracture is followed by the ASIS avulsion fracture are rare, accounting for just 1.4% of all pelvic and injuries^[6]. ASIS avulsion fracture is followed by the AIIS. Over 90% of these avulsion fractures occur between the ages of 14 and 17, with boys accounting for the majority of the cases^[1]. The simultaneous avulsion fracture of the ASIS and the anterior inferior iliac spine (AIIS) is even rarer^[7]. The ossification of ASIS takes place at 15 years of age while and fusion with the ilium takes place at 19 years of age^[8]. The ASIS ossifies and fuses with the ilium at 14 and about years later. The sartorius and the tensor fascia lata originate on the ASIS, whereas the direct head of the rectus femoris originates on the AIIS. The usual mechanism for ASIS

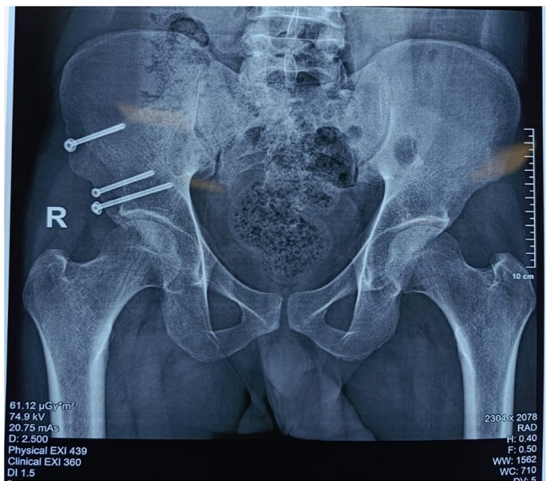


Figure 4. Follow up X-ray.

avulsion is a strong contraction of the sartorius and tensor fascia lata muscles against a hyperextended hip^[9]. A forceful combination of hip extension and knee flexion with sudden or uncontrolled forceful contraction of rectus femoris muscle is the mechanism behind AIIS avulsion^[1]. The possibility of AIIS fracture in a skeletally mature patient is very less^[10]. Diagnosis is typically suspected clinically and confirmed by pelvic radiographs. Majority of existing studies suggest that surgical intervention is necessary for the treatment of iliac spine fractures in younger, active patients, as well as in situations where the pieces are substantial and the displacement exceeds 2 cm^[7].

Conclusion

Open reduction and fixation with a cannulated cancellous screws used on our patient is a reliable and solid technique allowing a complete and rapid recovery of the level of sports activity^[7]. Following the operative treatment, we found early recovery of the level of sports activity in the patient.

Ethical approval

Not applicable.

Consent

Written informed consent was obtained from the patient for publication and any accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

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Author's contribution

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The authors have no conflict of interest to declare.

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Not applicable.

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