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Brief Report

Pubic ramus fractures

Challenges in managing pubic ramus fractures- Routine Computed Tomography for all pubic ramus fractures- Is there a role?

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Pelvic fractures are amongst the most common fragility fractures sustained by the elderly patient from falling from a standing height. There are significant complications arising from this type of fracture, ranging from the patient with haemodynamic compromise with an unstable pelvis to a patient with minimal displaced pelvic ring fracture without compromise. In this article, we aim to highlight those patients who may have had an innocuous injury but cannot mobilise despite analgesic optimization. There are currently two strategies undertaken with immediate CT imaging in all patients sustaining pelvic fractures at admission and delayed CT imaging for those patients who cannot mobilise. The main aim of imaging is to exclude the presence of a posterior pelvic ring injury and exclude any vascular injuries in the haemodynamically compromised patient.

Keywords: Pelvic fractures, Computed Tomography, Pubic ramus fractures

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Introduction

Pubic ramus fractures are amongst the most common fragility fractures sustained following a fall from the patient's standing height. As the population ages, the incidence of fragility fractures is also due to increased incidence, with a rough estimate of between 0.3-and 8% [1].

The management of pubic ramus fractures has been analgesia and early mobilisation. These patients are usually admitted under the care of the on-call medical team with subsequent input from orthopaedic teams as deemed necessary. The majority of these patients can gain a reasonable degree of baseline functioning following a multidisciplinary approach. However, there are concerns that a significant proportion of these patients have an additional posterior pelvic ring injury which does not get diagnosed early in the patient's journey.

Posterior pelvic ring injury (PPRI) can be often overlooked if solely based on plain radiographs. There is a paucity of literature correlating pubic ramus fracture and concomitant PPRI in elderly patients. Pubic ramus fractures and concomitant PPRI can present different characteristics than patients with isolated ramus fractures.

Possible characteristics that could signify PPRI [2]

- Pubic ramus fractures with markedly displacement medially to the obturator foramen.
- Complete anterior pelvic ring disruption.

Methodology

We reviewed the available literature on the incidence of posterior pelvic ring injury in patients sustaining pubic ramus fractures. We found that low back pain and tenderness in osteoporotic pubic ramus fractures can signify PPRI [3]. The incidence of PPRI could be detected in 96.8% of patients [4]. Even in cases where a PPRI is detected, 70% of these patients are treated conservatively. There is a high risk of mortality associated with non-operative management of pelvic ring injuries in the elderly ranging between 12-28% at 1-year compared to patients undergoing an operation. There remains much debate on the early utility of CT imaging to address this concern and whether any delay in CT leads to increased co-morbidity, given that most pelvic ring injuries are managed conservatively.

Management: The risk of mortality from pelvic ring injuries is comparable to that of hip fractures [5].

Discussion

Potential strategies: A possible strategy would be for all patients with pubic ramus fractures evident on initial plain radiographs to have CT imaging of the pelvis to ensure that PPRI is not missed at the earliest opportunity.

An alternative strategy will be for interval CT imaging of the pelvis if there is any difficulty mobilising these patients whilst addressing the analgesic requirements.

The impact of early diagnosis and management on long term prognosis using the first strategy remains to be evaluated in large studies. Most pubic ramus fractures are managed conservatively; however, there is a potential role for operative management in certain cases. Corona mortis (crown of death) is described as an abnormal connection between the obturator and external iliac or inferior epigastric arteries and veins in the space of Retzius [6].

A venous corona Mortis is 2-3 greater in prevalence than in arterial form. Intra-operatively this should be identified to avoid iatrogenic injury.

However, following trauma, this can form, and in patients with haemodynamic compromise, this should be considered a potential diagnosis. This must be further evaluated using CT Angiography.

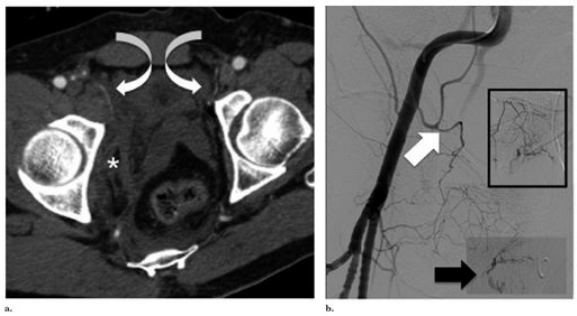

Image 1: Evaluation of corona Mortis using angiography [7]. In conclusion, as highlighted in this brief article, there is a potential role for early CT imaging of the pelvis to evaluate additional PPRI. In pelvic trauma and haemodynamic compromise, haemorrhage from corona Mortis should be considered and evaluated with angiography techniques. With the increased availability of CT imaging, this mode of investigation is likely to become the initial preferred mode of imaging.

Highlights

- Pubic ramus fractures are a common form of fragility fractures with increasing prevalence as the population ages.
- Initial plain radiography can lead to missed posterior pelvic ring injury.
- Missed PPRI can lead to excess mortality and morbidity, rates comparable to femoral neck fractures.
- Important to recognise haemorrhage from corona Mortis as a potential diagnosis in the patient with haemodynamic compromise in the context of trauma.

Conclusion

This article aims to address the need to exclude the presence of PPRI in patients whose trajectory of recovery does not follow as anticipated. The acute clinician would need to be cognizant of the potential diagnosis of corona mortis in the patient with haemodynamic compromise. Appropriate and timely imaging and subsequent management of this complication can be life-saving.

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