Bosworth Fracture-Dislocations: A Highly Unstable Variant

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Introduction

A Bosworth fracture-dislocation is a rare type of ankle fracture where the proximal fragment of the fibula is dislocated posterior to the incisura fibularis. These injuries are often associated with ligamentous injuries, compartment syndrome, post-traumatic arthritis and arthrofibrosis. Bosworth fractures have been documented to progress to severe disability and articular cartilage degeneration as well as rapid degenerative post-traumatic arthritis requiring arthrodesis. The most common mechanism of injury seems to be a supination external rotation as described in cadaveric studies. The significant rotational force required to create this fracture pattern disrupts most if not all of the syndesmotic structures.

Information

We describe a highly unstable variant of a Bosworth fracture. This article presents the case of a sixty-one year old male who fell down multiple stairs at his home and sustained an external rotation injury to his right ankle. To our knowledge, this Bosworth fracture variant has not been previously described in the literature. At the time of the initial examination sensation to light touch was grossly intact. There was an obvious deformity of the ankle with the tibia being more prominent anteriorly at the level of the ankle joint. An ankle block was performed in the emergency room. An audible clunk was heard and a near anatomic reduction was achieved. The patient was placed in a short leg AO plaster splint. Post reduction films were obtained and indicated an adequate reduction primarily. The patient’s pain was well controlled, an acceptable reduction was obtained, and there were no signs of current or impending compartment syndrome. Therefore, the patient was discharged home and instructed to be non-weight bearing and follow up in the office the next day. The patient was taken to surgery five days from the date of injury after swelling had decreased. After the risks, benefits, alternatives and possible complications were reviewed with the patient he decided to proceed with surgical intervention.

Figures

Figures 1-3: A/P, lateral, and mortise views of the initial injury films with the radiographic “axilla” sign (arrow) noted with the medial tibial plafond visible on x-ray due to internal rotation of the tibia when the fibula is dislocated posteriorly.

Figures 4-6: A/P, lateral, and mortise views of the post reduction films showing a near anatomic reduction.

Figures 1-3: A/P, lateral, and mortise views of the post-operative films showing anatomic reduction and internal fixation of this unstable Bosworth fracture variant.

Discussion

Bosworth fracture-dislocations are challenging to recognize and treat appropriately. Bosworth fractures are frequently missed initially and are commonly discovered after being irreducible. Our case report was a highly unstable variant to the Bosworth fracture. Initially the typical perching of the proximal fibula fragment behind the incisura fibularis was evident. The demonstration re-dislocated in the five days prior to surgery and made this an unstable variant. It is unknown when the fibula re-dislocated. Bosworth’s original paper, as well as subsequent other papers, describe difficulty with reduction of this type of fracture and the necessity for operative treatment instead of non-operative management. Open reduction with internal fixation and close examination of the syndesmosis with likely syndesmotic fixation is the treatment of choice. Bosworth fractures are also known to have complications similar to ankle fracture-dislocations. Posttraumatic arthritis is a known complication from initial non-operative treatment, inadequate fixation or failure to recognize this unique type of fracture-dislocation. CT scan may prove helpful in identifying the Bosworth variant and aid in surgical planning.

Conclusions

Our case report is unique in that the fracture was able to be reduced initially but subsequently re-dislocated due to the inherent instability of the fracture pattern. One may easily be deceived after obtaining an initial closed reduction of the Bosworth fracture and not realize that it may have re-dislocated in the splint if the patient is not closely observed. It is also our recommendation after review of the literature that fixation should be performed urgently when a fracture is unable to be close reduced, within 24-48 hours after injury. The actual incidence of Bosworth fracture-dislocations appear to be rare but the consequences of not recognizing them can be detrimental to the patient. Following the recommendations of close monitoring and early open reduction and internal fixation might help prevent some of the complications associated with Bosworth fracture-dislocations and provide a framework for proper treatment of this rare fracture-dislocation.

References

2. Liu, TH; Chan, KB; Kong, CC; Ngui, WK: Ankle Stiffness after Bosworth Fracture Dislocation of the Ankle. Arch Orthop Trauma Surg. 2008;128:49-53