# The Incredible Odyssey of Jones

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**Learning Point of the Article:**

Jones fracture is one of the most common fractures of the base of fifth metatarsal of the foot. Although our knowledge of Jones fracture has been refined and evolved over the years but controversies still exist regarding its uniform terminology and management options. In this editorial, we have discussed the definition of Jones fracture, its historical background, epidemiology, classification systems, and evidence-based management recommendations.

## Introduction

A fracture of the base of the fifth metatarsal of the foot at the junction of metaphysis and diaphysis and located at the fourth and fifth inter-metatarsal articulation is termed Jones fracture [1]. This fracture is named after Sir Robert Jones a British Orthopedic surgeon who first described it in 1902 when he reported this fracture in six patients including himself when he sustained this fracture while dancing [2]. All the six fractures described by Jones were as a result of indirect trauma and all were treated successfully with non-surgical measures. Jones fracture is still a topic of controversy even after more than hundred years of its first description. More knowledge of this fracture has been gained than originally described by Jones. Sir Robert Jones did not classify this fracture. He described this fracture as any fracture at the base of fifth metatarsal within three fourth of an inch. The evidence about Jones fracture is very heterogeneous due to which interpretation is very difficult. There is inconsistencies in exact definition of Jones fracture, classification, treatment and variable union rates of this fracture and application of evidence to individual patient is not easy [3]. Jones fracture has very unique anatomy. Due to poor blood supply resulting in avascular water shed area and stress forces caused by attachments of Peroneus Brevis, nonunion rates of 20.8% have been reported in acute Jones fractures treated conservatively [3-7].

The prevalence of acute Jones fracture is 26.35% in the general population [8]. It is caused by any injury causing adduction of the plantigrade foot [2]. Jones fractures are common in general population with female to male ratio of 2:1 but male athletes involved in certain sports requiring frequent jumping like basketball players are more prone to sustain this fracture than females in the general population [9, 10].

Acute Jones fractures are diagnosed clinically by the presence of pain, swelling, tenderness, ecchymosis, and difficulty in walking and radiographically by performing X-ray anteroposterior, lateral, and 30–45° oblique views of the injured foot [11].

Over the years many classification systems have been proposed. The most widely used radiographic classification was proposed by Torg et al. [12] in 1984. According to his classification, Jones fracture has three types: Acute fracture (type I), Delayed Union (type II), and Nonunion (type II). Acute fracture has sharp margins but no intramedullary sclerosis. The delayed union will have fracture line widening and the presence of intramedullary sclerosis. Nonunion has a history of repeated injury, fracture line

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widening, obliteration of intramedullary cavity and new bone formation from adjacent periosteum. In 1993 Lawrence and Botte [13] described Jones fracture as any fracture present at the level of inter metatarsal articulation (zone II). Two other classifications identical to Lawrence were proposed by Clapper et al. [14] and Dameron [15] in 1995.

Initially, Jones fractures were treated non-operatively with prolonged immobilization in a non-weight bearing plaster cast. Various non-operative treatment modalities include elastic bandage, short leg non-walking cast, Hard-Soled Shoe, and walking boot [4]. Variable results have been reported with these non-weight bearing modalities. Prolonged weight bearing restriction; however, have been associated with compromised functional outcome, ankle stiffness, muscle atrophy and reduction in bone mineral density [16, 17]. Torg et al. [12] reported a landmark study in 1984 and documented 93% union rates in acute Jones fractures treated with non-weight bearing plaster cast for 8 weeks. Other researches however reported non-union rates ranging from 28% to 50% with weight-bearing immobilization [5, 9]. Recent studies recommend functional treatment utilizing early weight bearing foot cast for undisplaced or minimally displaced acute Jones fractures in nonathletes [11]. The matter of debate however is the choice of cast. The traditional below knee walking cast has largely been replaced by walking foot cast to avoid ankle stiffness and improved functional outcome but randomized controlled trials comparing below knee walking casting versus walking foot cat are still lacking [17].

Jones fracture is common in athletes. To enhance recovery and encourage early return to sports many researchers advocated surgical fixation of these fractures in athletes and other high-demand patients [16, 18]. No ideal implant has been recommended to fix Jones fracture and a variety of implants including K wires, cannulated screws, cancellous screw, tension wiring, low profile mini plates, hook plate, Jones fracture specific screw and Jones Specific Implant has been used in literature to stabilize these fractures [11, 19-21]. Surgical interventions have a complication rate of 19% and include nonunion and refracture [3]. One must be aware of bony abnormalities and anatomic variations while fixing Jones fractures. Kavanagh and Burgess [22] reported three cases of Jones fractures which were associated with unique anatomic variations of Os Vesalianum, Metatarsus Adductus and Peroneal Tubercle. These authors provided useful surgical tips to fix these fractures effectively.

## Conclusion

In this editorial, we have provided an overview of Jones fractures. Treatment of acute Jones fractures however should be individualized keeping in mind the fracture displacement, age, associated injuries, comorbidities, physical demands, and expectations of the patient. Patients should be educated and actively involved in decision-making. To avoid confusion and discrepancy in the exact definition of Jones fracture we suggest using Lawrence and Botte and Torg et al. classification in combination. Several areas of research are still open including suture fixation (Fiber wire) of Jones fracture. Multicenter randomized trials are needed to provide evidence-based treatment recommendations. We feel that more will be discovered about the unique features of Jones fractures and we will be able to gain more useful insight about this fracture in the near future.

**Declaration of patient consent:** The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given the consent for his/ her images and other clinical information to be reported in the journal. The patient understands that his/ her names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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