

Femoral fracture in an amputation stump: Impact of body weight on prosthetic rehabilitation

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Abstract

Presentation

We report a case of a 60-year-old male with bilateral lower limb amputations who sustained a fracture to his right residual femur after weight bearing on his prosthetic leg during therapy. This was attributed to his raised body mass index that fell in the morbidly obese category.

Diagnosis

Patient was referred for orthopaedic management and reviewed by the multidisciplinary prosthetic rehabilitation team following the fracture recovery.

Treatment

He was deemed unsuitable for further prosthetic usage and ultimately referred to the national weight management service and the bariatric team.

Discussion

Fracture of the residual limb in an amputee is not a common occurrence. There is a scarcity of information regarding fractures in an amputation stump of obese individuals. This is an unusual case which highlights the significance of body weight on lower limb prosthetic usage, impact on rehabilitation and the need to address weight management at an earlier stage post amputations.

Case Report

A 60-year-old male was admitted to the hospital day unit for lower limb prosthetic rehabilitation. He had bilateral lower limb amputations i.e., a right transtibial amputation 7

years ago and a recent left transfemoral amputation 6 months ago due to complications of type 2 diabetes mellitus and peripheral vascular disease.

He had been successfully mobilising with a right below knee prosthesis after his first amputation without any aids or assistance till he met with his second amputation subsequent to which he gained a significant amount of weight.

The goal of his admission was for him to be able to resume walking with a right sided below knee prosthesis with the aid of a bariatric walker. During his physiotherapy session a week after the admission, as he stood up on the prosthetic leg, he developed sudden onset pain in his right leg with an audible 'pop' heard by the physiotherapist. The leg was x-rayed to investigate further.

Unfortunately, he sustained a fracture of his right femur as shown in the x-ray (*Figure 1*). His rehabilitation was discontinued, and he was transferred to the orthopaedic department where he was advised conservative management as the fracture was minimally displaced

(5mm) and not to weight bear for 3 months. His DXA showed normal bone mineral density.

Of note this patient weighed 155 kgs with a body mass index of 50 which placed him in the morbidly obese category.

He was readmitted after 3 months of recovery time to review his potential at which stage the multidisciplinary rehabilitation team concluded that he would not be an appropriate candidate for further prosthesis usage as his body weight was contributing to uncontrolled blood sugar levels, increased need for assistance and low motivation. He was consulted by the team's dietician and diabetic nurse to devise a nutritional plan and the psychologist for mood management. The team ultimately referred him to the national weight management service for further pharmacological and surgical options and planned future follow up.

From the patient's perspective, he understood that weight reduction was the primary goal and using a prosthetic leg carried more risk than benefit at that stage. He was determined to lose weight and improve his overall health in consultation with his endocrinologist and community dietician.

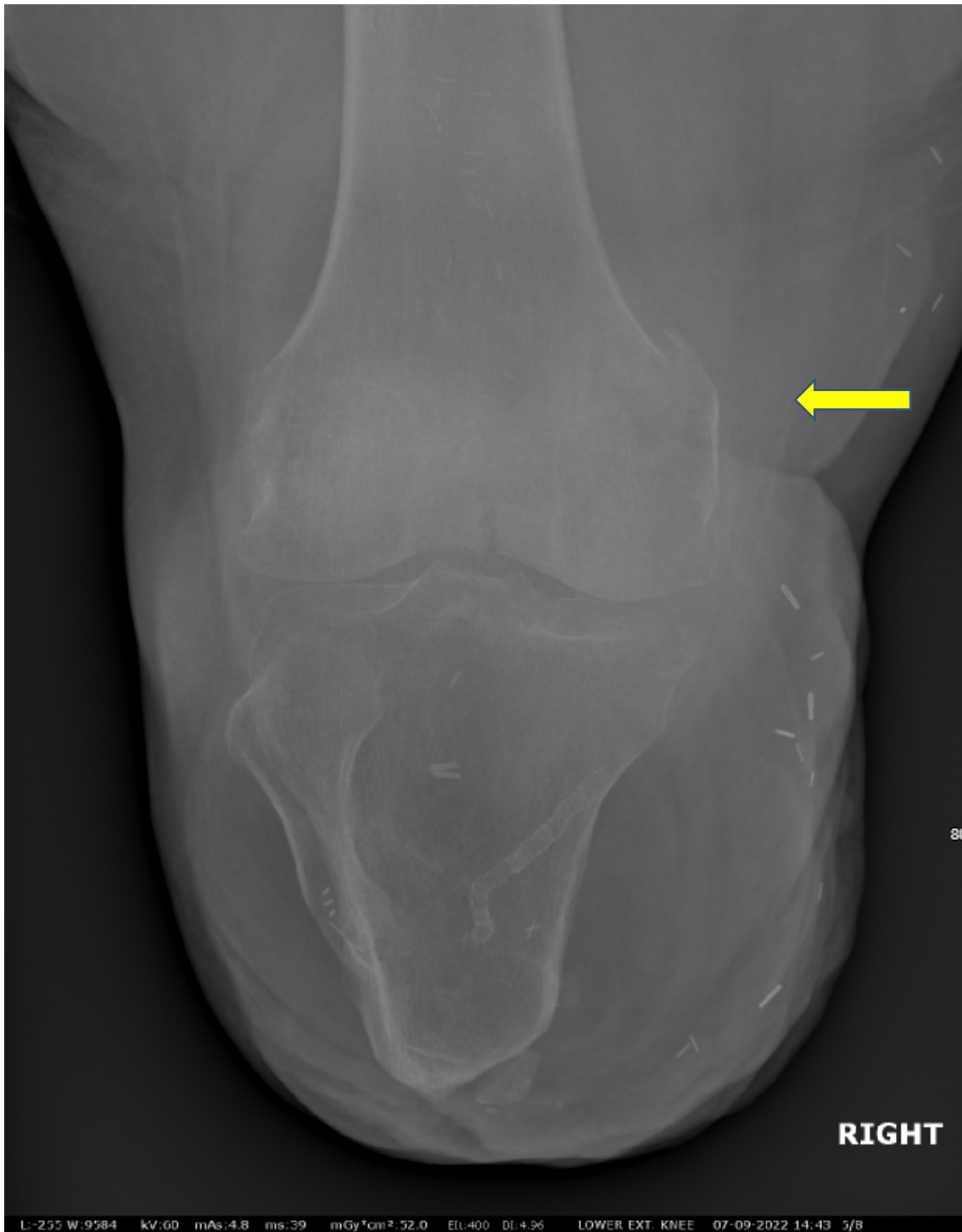


Figure 1:

X-Ray of the right thigh showing an acute intra-articular fracture of the medial femoral condyle extending from the intercondylar notch to the adductor tubercle

Discussion

This was an interesting and challenging case for the prosthetic team. We concluded that the femoral fracture was most likely due to the mechanical impact of the body weight on the prosthesis upon weight bearing hence, further rehabilitation could only be successful and safely carried out after weight reduction.

The increased body weight placed the patient at risk of musculoskeletal pain, fractures, falls and injuries. In addition to this, walking with a prosthesis required extra energy expenditure which made it even more a laborious task for the patient and the team.

Interestingly, the patient had a normal bone mineral density.

Although it has classically been established that obesity could be a protective factor against osteoporosis and fractures, in recent years there is a growing body of evidence which contradicts this. Nielson et al. (2012) showed that close to half (46%) of hip fractures occurred in overweight and obese older adults using data from the 1970 to 1980s.¹

In addition, patients with diabetes, although they usually have a normal or even high bone mineral density, have a paradoxical increase in the risk of hip fracture by 1.3 to 2.3 times.²

The patient's weight posed further rehabilitation difficulties including manual handling risks, finding bariatric equipment, need for assistance for transfers and mobility practice.

Apart from physical and occupational therapy, bariatric amputees are also seen by psychology for mood assessment and motivation.

Prosthetic componentry has distinct weight limits which must be considered during prescription. As people with amputation approach the limits of specific components, Rehabilitation physicians and Prosthetists are faced with the challenge of continued provision in a safe and suitable manner.³

Hence, early identification of these individuals achieves better rehabilitation outcomes by tailoring their rehabilitation goals. They must also be referred to appropriate weight management and intervention services in a timely manner to prevent further complications.

Declarations of Conflict of interests:

None declared.

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