Distal Tibia Fracture Pattern After Medial Transmalleolar Drilling

Patrick Allan Massey, Gabriel G Sampognaro[1], Carver Odom Montgomery, Mason Favre[2], Tara Ann Saxena, Giovanni Francesco Solitro[3]
[1]Orthopedics, LSUHSC Shreveport, [2]Orthopedics, [3]Louisiana State University Health Shreveport

INTRODUCTION:

Osteochondritis dissecans (OCD) of the tibiotalar dome are often surgically managed using autologous osteochondral graft implantation. Lesions located on the medial talar dome pose a unique challenge due to difficulty accessing this area, the Medial Transmalleolar Portal (MTP) is a novel technique for this approach. In this study we will describe the post-operative fracture pattern and mean load to failure when compared to intact ankles utilizing a cadaveric model. We will assess differences between the types of fractures that may occur between these two groups using the AO/OTA fracture classification, as well as assess for differences in load to failure.

METHODS:

Twelve Medial Transmalleolar Portals (MTP) were created by a senior orthopedic surgeon. These ankles were matched to twelve other, non-osteoporotic ankles for comparison. Each specimen was compressed against a steel base plate at a rate of 60 mm/minute to simulate a compression type fracture, gross failure was indicated by a sharp drop in resistance. An Instron machine was used to measure the load to failure. We then evaluated each fracture, and an AO/OTA fracture classification was assigned by a senior author. A t-test was used to analyze differences in mean load to failure. Difference between fracture types was assessed using a Chi-Square test between the two groups.

RESULTS:

The mean load to failure for the portal group was 2937.65 N, while the mean failure load for the control group was 3560.4 N (p=0.56). No significant difference was identified in the type of fracture that occurred between the control and MTP groups.

DISCUSSION AND CONCLUSION:

There is no significant difference in the mean load to failure or type of AO/OTA fracture sustained after a compression type fracture of the distal tibia between ankles with a medial transmalleolar portal and control. Our study indicates that MTP can be performed safely, without increased risk for fracture or risk for more complex fracture patterns.