

Treatment Of Osteosarcoma Distal Femur Using Liquid Nitrogen Cryotherapy: Our Technique

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INTRODUCTION

Limb salvage has become the main surgical option in treating lower limb osteosarcoma. Biologic reconstruction using recycled tumor bearing autograft has the benefit of being simple, cheap and durable.

REPORT:

A 16-year-old female patient presented with gradually enlarging right thigh swelling over the course of a year. Clinical examination revealed a firm to mass at the anterior medial aspect of the right distal thigh. Local and systemic staging were performed, diagnosis of osteosarcoma was confirmed with local biopsy of the distal thigh . Patient received neoadjuvant chemotherapy and underwent wide resection distal femur, liquid nitrogen bone recycling and biplating of the right femur.



Figure 1: Radiograph show sunburst appearance (Left). Post Cryotherapy and biplating (Middle). Union achieved (Right)

Anteromedial incision was made and a total length of 24 cm tumor bone was completely resected at the region 3 cm above and below the lesion with preservation of adjacent joint, according to pre-chemo MRI images guidance.



Figure 2: Image of excised bone pre and post submersion in liquid nitrogen (Left, middle). Final fixation using double locking plate (Right).

The resected bone is then submerge 15 minutes in liquid nitrogen, thawed under room air for 15 minutes and 15 minutes soaked in distilled water. Attached soft tissues, periosteum and gross tumors were removed prior. Multiple holes were made to prevent drastic expansion and constriction. Final stage the resected bone was re-implanted and fixed with double distal femoral locking plate. Neurovascular bundle was well preserved in this technique. In this case, absolute stability achieved with double plate using distal femoral locking plate. Union is the aim of this technique.

CONCLUSION:

Various limb salvage techniques each possess their own unique advantages and disadvantages. Distal femur osteosarcoma can be treated using liquid nitrogen cryotherapy, which yielded a favorable therapeutic outcome.

REFERENCES:

1. Yamamoto N, Tsuchiya H, Tomita K. Effects of liquid nitrogen treatment on the proliferation of osteosarcoma and the biomechanical properties of normal bone. *J Orthop Sci.* 2003;8(3):374–80.