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Background: Osteochondroma is a benign outgrowth of medullary and cortical bone that is covered by a cartilaginous cap. It is the most common primary benign bone tumor and usually presents as a solitary lesion, except in patients with Multiple Hereditary Exostoses (MHE). Clinically, osteochondromas can compress tendons, nerves, and blood vessels and can cause mechanical symptoms, pain and rarely complications such as pseudoaneurysms and neuropraxias. Indications for excision include pain, limitation of motion and impingement on tendons, nerves, or blood vessels.

Question/Purpose: The objectives of this study is to review our experience with osteochondromas that project into adjacent neurovascular structures including clinical presentation, surgical technique and outcomes.

Patients and Methods: There were 55 patients who presented to us with osteochondromas between 2007 and 2015. Of the 55 tumors, five osteochondromas were projecting into neurovascular structures. There were 3 males and 2 females with an average age at time of surgery of 21 years (range: 11-41 years). The osteochondromas arose from the fibula (n=2), proximal tibia (n=1), distal femur (n=1) and proximal humerus (n=1). In each patient the neurovascular structures were identified and isolated in normal tissue both proximal and distal to the osteochondroma and then meticulously separated from the tumor. Once mobilized and protected, the osteochondroma was removed from the bone of origin by transecting it flush at its base. At final follow-up, all patients were assessed for bone healing as well as pain, range of motion and function according to the Musculoskeletal Tumor Society (MSTS) score.

Results: Average length of follow-up was 3.8 months (range: 3-5 mos). Pre-operatively, all 5 patients presented with pain that interfered with activities. One patient presented with numbness and another with a hematoma without a fracture. There were no cases of deep vein thrombosis or pseudoaneurysm preoperatively. Post-operatively, all 5 patients' pain was eradicated and all resumed normal activities including athletics. One patient with a fibular osteochondroma developed weakness of the tibialis anterior postoperatively that resolved with physical therapy. There were no cases of deep vein thromboses, arterial injuries, neuropraxias, extensive bleeding, hematomas, fractures or infections. The average estimated blood loss due to surgery was less than 10 cc in 4 patients and 250 cc in the patient who presented with a hematoma. At final follow-up all patients had an MSTS score of 30 (rated 5 in each category).

Conclusions: Many osteochondromas are benign, asymptomatic tumors that can be observed with follow-up imaging studies negating the need for surgery. There is controversy however if osteochondromas that project into neurovascular structures should be routinely resected based on rare potential neurovascular complications from chronic compression or laceration. All of the patients presented in this paper had preoperative pain and limitation of function. In addition, one patient had injured a minor vessel preoperatively that resulted in a hematoma and another patient had a preoperative neuropraxia of the sensory portion of a nerve. All patients underwent successful resection without any major neurovascular complications. Patients with symptomatic osteochondromas projecting into adjacent neurovascular structures can undergo safe and reliable resection. We believe that a meticulous neurovascular dissection permits safe mobilization of the neurovascular structures and prevents inadvertent injury. To our knowledge this is the only case series that has been reported regarding resection of these types of osteochondromas.