

Abstract # 10677

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**BACKGROUND:** The shoulder girdle, comprised of the proximal humerus, scapula, and clavicle, is the third most common site of bony tumors. Bony tumors of the shoulder girdle occur most frequently in the proximal humerus, followed by the scapula and the clavicle. Prior studies have determined that tumors occurring in the scapula have a higher risk of malignancy than those in other sites of the shoulder girdle. Currently, there is limited literature describing tumors of the scapula. The purpose of this study is to analyze the types and frequency of bone tumors occurring in the scapula, and to identify potential indicators of malignancy in this site.

**METHODS:** A retrospective analysis of 105 patients seen at our institution between 1990 and 2015 for bone tumors of the scapula was performed. Diagnosis, tumor location, and patient demographics were collected. Diagnosis was determined by pathologic and/or radiologic studies. Our results were attained through use of descriptive statistics.

**RESULTS:** Malignant tumors (n=62, 59%) were more common than benign tumors (n=43, 41%). The mean age of patients with benign tumors was 30 (range: 7-59 years). Osteochondromas (n=24, 56%) were the most frequently occurring benign lesions, followed by osteoid osteomas, which constituted 14% of benign tumors (n=6). There were 1-3 instances each of aneurysmal bone cyst, chondroblastoma, desmoplastic fibroma, enchondroma, fibroxanthoma, giant cell tumor, osteomyelitis, and Paget's disease recorded. The majority of benign cases involved the body of the scapula (n= 31, 72%). 14% were found in the glenoid (n=6), 12% in the acromion (n=5), 9% in the spine (n=4), and 7% in the coracoid (n=3). 12% of cases involved more than one of these sites (n=5). For the cases in which radiographic imaging was available, 35% of benign tumors appeared lucent (n=15), 42% appeared radiodense (n=18), and 9% were of mixed appearance (n=4).

Of patients with malignant tumors, the mean age was 53 years (range: 10-80 years). 77% of patients diagnosed with a malignant tumor were age 41 or greater. Gender was not found to be an indicator of malignancy (P=0.41). 60% of scapular malignancies were primary tumors (n= 37); the most prevalent types were chondrosarcoma (n=17, 27%) and osteosarcoma (n=7, 11%). Primary malignant tumors were most commonly located in the body (n=22, 59%), followed in descending order by the glenoid (n=11, 30%), the coracoid (n=6, 16%), the spine (n=4, 11%), and

the acromion (n=3, 8%). 24% of cases presented with lesions in more than one of these sites. Of the 25 patients with metastatic disease to the scapula, 56% were metastases from the lung (n=14). Metastases to the scapula occurred most frequently in the glenoid (n=12, 48%), followed by the body (n=9, 36%), the coracoid (n=6, 24%), the spine (n=4, 16%) and the acromion (n=2, 8%). 32% of cases involved more than one of these sites (n=8). In a review of available imaging, 79% of malignant tumors (n=49) were lucent, 10% were radiodense (n=6), and 8% were of mixed appearance (n=5). The difference in number of lucent-appearing benign tumors versus malignant tumors is statistically significant ( $P < 0.001$ ).

**CONCLUSIONS:** To date, there are few descriptive studies of bony tumors of the scapula. We have described a large retrospective series of 105 scapular tumors, and examined potential indicators of malignancy. Gender was not found to be associated with malignancy, but the likelihood of scapular tumor malignancy increases for patients older than 40 years. Tumors that appear lucent in radiographic imaging are also more likely to be malignant.