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Shoulder girdle resection, modification in the surgical techniques and introduction of a new classification system

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Background: Surgical techniques for resection of tumors at proximal humerus and scapula has been described in literature along with different classification systems, however, these techniques have not been revised for a while and the classification systems didn't respect the difference between bone and soft tissue tumors, or humerus vs scapula locations.

Material and Methods: The author operated on 27 patients with shoulder girdle tumors, all are bone tumors, Ewings sarcoma (n=10), Osteosarcoma (n=6), Metastatic tumors (n=5), GCT (n=3), Chondrosarcoma (n=3). We assigned two separate classifications to humerus and scapula resection, since surgical techniques, mechanics and reconstruction is totally different for the both sites. Resection of the humerus classified into: Type I to Type IV, A: is added to the type when the majority of Deltoid is preserved, and B: when it is sacrificed.
Type I: Intra articular proximal humerus resection (Fig 1)
Type II: Extra articular proximal humerus resection (Fig 2)
Type III: Intra articular total humerurs resection (Fig 3)
Type IV: Extra articular total humerus resection (Fig 4)
And we classify the scapula resection into: Type I to Type III
Type I: Partial Scapular Resection (Fig 5)
Type II: Intra articular Total Scapular Resection (Fig 6)
Type III: Extra articular Scapular Resection (Fig 7)
In extra articular humerus resection, we found that sacrificing the acromion and coracoid process is not needed as a routine part of the extra articular resection of the proximal humerus and preservation of these structures can improve the cosmetic outcome of the shoulder, and for all tumors with no huge medial component, in our techniques there is no need to detach the muscle attachment from the coracoid process and so post operatively elbow extension as tolerated can be started immediately. Endoprosthesis was used in 23 patients for reconstruction, osteoarticular allograft was used in 2 patients, and Tichoff Lindberg technique for 2 patients.

Results: At 30 month mean follow up period, 2 patients developed local recurrence (osteosarcoma n=1, Ewing Sarcoma n=1), and 2 patients infection, one patient stem loosening, the average MSTS functional score for all patient was 83%.

Conclusion: The modification of surgical techniques saved structures which were unnecessarily resected, and kept the integrity of more muscular tissue and attachments which were detached in previous described techniques with no obvious advantage leading to less restriction during the rehabilitation process. The new classification system is realistic, easy to be recalled and applicable to all patients.

Figure 1

Figure 2

Figure 3

Figure 4

Figure 5

Figure 6

Figure 7