Low Dose Radiotherapy and Staged Surgical Resection for Diffuse Pigmented Villonodular Synovitis of the Knee Preserves Normal Knee Function With Minimal Risk of Recurrence

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INTRODUCTION:

Pigmented villonodular synovitis (PVNS) of the knee is a benign, proliferative synovial disorder characterized by recurrent effusions and knee pain. Chromosomal analysis suggests that it is a true neoplasm and not an inflammatory process. There is a localized and a diffuse form of the disorder with the localized or nodular version amenable to limited, even arthroscopic resection. The diffuse form of PVNS, however, affects the entire synovial surface and has been shown to have a high rate of local recurrence with limited resection. We have utilized a uniform treatment protocol of staged anterior and posterior synovectomies, followed by low-dose external beam radiation therapy, for high-risk patients with intra- and extra-articular disease and report the results here.

METHODS:

From 1989 to 2000, 24 patients underwent surgical resection for PVNS of the knee by the same surgical team. Eight patients with diffuse PVNS, with both intra- and extra-articular disease, underwent staged anterior and posterior synovectomies and post-operative external beam radiotherapy with cumulative doses of 3000 - 4500 cGy. Patients were followed postoperatively at 3 - 6 month intervals by physical exam and magnetic resonance imaging (MRI).

RESULTS:

• The study group consists of four females and four males with an average age of 33 years (range 14 - 51 years) at the time of surgery. The average follow-up interval was 39 months (range 12-57 months).
• Three patients presented with recurrent disease after one or more previous procedures.
• There were no local recurrences. One patient demonstrates a 2-centimeter posterior nodular mass on routine post-operative MRI at 55 months but is asymptomatic.
• There were no wound complications requiring surgery. There were no arterial or nerve injuries.
• Five patients have no complaints of pain or limitation of activities. Two patients complain of mild, occasional, activity related knee pain and/or subjective instability. One patient, aged 51, developed moderate degenerative joint disease during postoperative follow-up (now 6 years).
• Average post-operative knee extension at the most recent examination was +2 deg (range 0 - 5 deg) and average flexion was 116 deg (range 90 - 135 deg).

CONCLUSIONS

1 This study is valuable because it is limited to high-risk patients with intra- and extra-articular PVNS of the knee treated uniformly.
2 A protocol consisting of staged anterior and posterior synovectomies, followed by low-dose post-operative external beam radiation, leads to excellent functional results with minimal risk of recurrence.
3 Surprisingly, all patients had extra-articular disease noted during popliteal exploration. We believe that anterior synovectomy or arthroscopy alone is inadequate treatment for diffuse PVNS of the knee.