

## Radiological Case of the Month

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**A** 17-YEAR-OLD boy was examined by a medical profile committee prior to army induction. He reported an existing problem in his right shoulder. While playing basketball at school, he had a radiograph obtained of his painful shoulder (**Figure**).

He was referred to an orthopedic surgeon who suggested that surgery was indicated. The pain subsided and no surgery was performed. On inspection the contour of

the shoulder was normal. He had full strength and full range of motion.

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# Denouement and Discussion

## Synovial Chondromatosis

**Figure.** The radiograph of the shoulder demonstrates multiple densely calcified masses throughout the shoulder joint bursa.

In the embryo, tissue differentiates into synovium and articular cartilage. If hyaline cartilage develops within the synovial membrane at points of reflection, cartilaginous bodies are nourished through the synovial pedicle and deposited into the joint space where they obtain nutrition via synovial fluid. These cartilaginous bodies undergo endochondral ossification. The presence of intra-articular bodies may damage the joint's articular cartilage. Considerable controversy exists as to the nature of these chondral bodies. Apte and Athanasou<sup>1</sup> reported the presence of a different antigenic phenotype, while de-Bont et al<sup>2</sup> found mature chondrocytes by electron microscopy. Leu et al<sup>3</sup> observed an independent chondroid matrix and found basal lamina-like material not found in mature chondrocytes, which they postulated as a prechondroblastic precursor cell responsible for formation of chondromatosis.

Synovial chondromatosis is rarely seen in young people, although isolated cases in the knee<sup>4</sup> and the hip<sup>5</sup> have been reported. Reports involving the wrist<sup>6-9</sup> and elbow<sup>10</sup> appear in the literature with a prevalence in the 40- to 50-year age group. In affected individuals, recurrent effusions limit the range of movement, and chondral fragments cause joint locking. The involved joints are warm and painful. Radiography is usually sufficient to make the diagnosis, but air arthrogram has been reported as contributory in confirming the diagnosis.<sup>11,12</sup>

There is no consensus as to the management of synovial chondromatosis. Maurice et al<sup>13</sup> reported an 11.5% recurrence rate after synovectomy or the simple removal of loose bodies.

Ogilvie-Harris and Saleh<sup>14</sup> reported that synovectomy lowers the recurrence, but others found no difference between removal of loose bodies and synovectomy.<sup>15</sup> Dorfmann et al<sup>16</sup> reported good results in 78% of patients with a single arthroscopic procedure where the loose masses were removed without a synovectomy. Understanding of the etiology underlies treatment. Those believing that this condition is benign remove the loose bodies, while those whose concept encompasses pathological synovium favor eradication of that tissue. Chondrosarcoma has been reported in conjunction with chondromatosis.<sup>17-20</sup> Whether this is a separate entity or a form of chondral metaplasia remains unclear. The usual general approach to management is removal of loose bodies, with synovectomy reserved for progressive (recurrent) chondromatosis, a more radical approach.

These intra-articular free bodies are usually numerous within the shoulder bursa, and excessive physical activity may cause the condition to become symptomatic

and potentially cause degenerative arthropathy of the shoulder. Regardless of an asymptomatic history, the potential for deterioration exists, and the individual requires protection from overuse of the affected joint.

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