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Extraskeletal ossifying chondroma in the knee

A case report

A case of a large extraskeletal and extrasynovial ossifying chondroma in the infrapatellar space is presented with a review of the literature.

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Soft tissue chondromas most often occur in the hands and feet (Enneking 1983). A large solitary, para-articular ossifying chondroma lying loose in the infrapatellar space is uncommon and thought to be the result of synovial cartilaginous metaplasia (Jaffe 1958, Milgram & Dunn 1980). The role of trauma is unsettled (Kautz 1945, Sarmiento & Elkins 1975). We report one patient with such a tumour and summarise previously reported cases to analyse the natural history of this condition.

Case report

A 29-year-old man complained of a non-traumatic, painless swelling in the right knee, noted 2 years previously and growing slowly. A firm 5 × 4 cm mass extended on both sides of the patellar tendon. There was no effusion and the range of motion was normal.

Radiographs showed an infrapatellar radiopaque lesion (Figure 1). An isotope scan showed high activity in the tumour.

At surgery, an extrasynovial osteochondral tumour with a thin fibrous envelope was found beneath the patellar tendon. There were no changes in

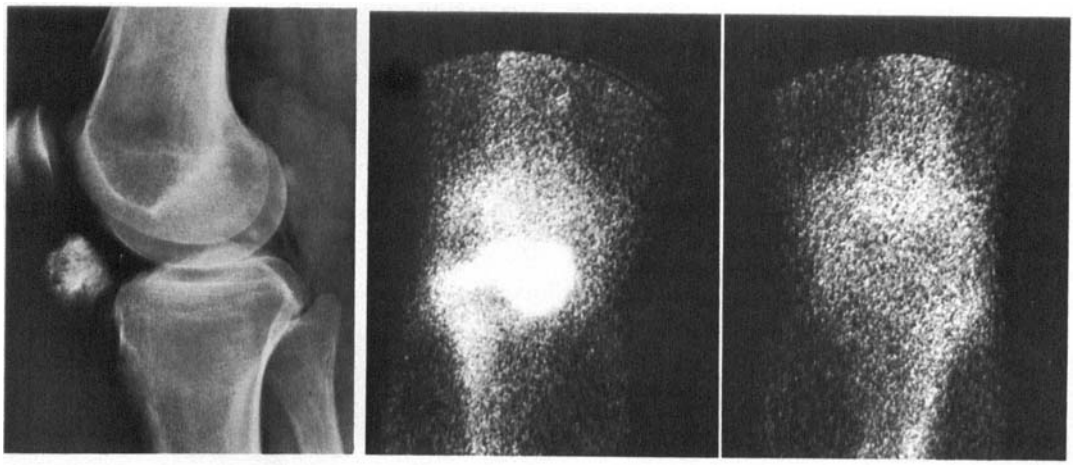

Figure 1. Lateral radiograph of the knee showing an infrapatellar mass with irregular calcification. Isotope scan of both knees showing high activity in the lesion.

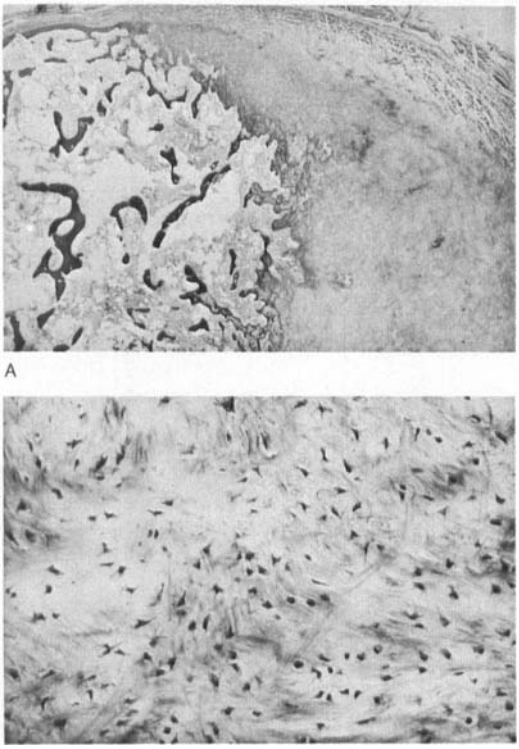

Figure 2. Photomicrographs of extraskeletal ossifying chondroma.
A. Low-power view shows bone trabeculae and cartilaginous tissue with enchondral ossification at the border (H and E × 25).
B. High-power view shows proliferative foci within the cartilage. Note stellate cells and slight nuclear atypism characteristic of chondroma (H and E × 450).

the surrounding tissues. The tumour was not attached to the skeleton, to the patellar tendon or to the intra-articular structures. A marginal excision was done. Functional recovery was complete within 2 months. The patient was asymptomatic 1 year later.

A cross-section showed an osseous centre covered by heavy layers of cartilage. Microscopic examination showed trabecular bone attached to cartilaginous tissue (Figure 2). In the trabecular bone there were foci of osteoid formation in a fibrous stroma, and at the border between bone and cartilage enchondral ossification was seen. The cartilaginous tissue was mostly fibrocartilaginous with areas of degeneration, but hyaline cartilage was also seen. No pronounced cellular atypism or mitotic activity could be observed.

Discussion

About 25 cases of para-articular or intra-articular osteochondroma in the infrapatellar space have been reported, of which ten were in detail (Table 1). In the majority of these cases there was no trauma. The two patients of Kautz (1945) gave a rather vague history of repeated minor injuries to the knee. The only completely intra-articular lesion (Sarmiento & Elkins 1975) may have been the result of an osteochondral fracture and not a neoplastic growth; a giant osteochondral loose body of the knee joint has been reported after an intra-articular fracture of the proximal tibia (Das & Mukherjee 1978).

In our patient, who had had symptoms for 2 years, the high isotope activity indicated that the process of ossification was still unfinished. The three patients in the literature with the longest duration of symptoms were among the

Table 1. Extraskeletal ossifying chondromas of the infrapatellar space: data obtained from the literature.

Authors	Age	Sex	Duration of symptoms (years)	History of trauma	Extrasynovial = E Intrasynovial = I	Longest diameter (cm)
Robillard (1941)	35	F	2	Yes	E	6
Roth (1944)	69	M	4	No	E	6
Kautz (1945)	51	F	No data	Repeated minor	E	5
	47	M	<1	Repeated	E	4
Mosher et al. (1966)	23	F	1	No	E	7
	66	M	<1	No	E	3
	65	M	5	Yes	E	7
Sarmiento & Elkins (1975)	67	M	7	Yes	I	8
Milgram & Dunn (1980)	66	F	'Several'	No	I (partly)	No data
Milgram & Jasty (1983)	59	M	10	No	E	9
Present case	29	M	2	No	E	5

four with the largest tumours. The size of these tumours was about the same and probably limited by the bony architecture of the infrapatellar space. The histological picture suggests that a multifocal enchondral ossification takes place, resulting in a coalescing osseous core. The minimum time required for complete ossification can be estimated at 3–4 years.

Extraskeletal ossifying chondroma of the infrapatellar space must be distinguished from heterotopic ossification of the patellar tendon (Holstein et al. 1963), epiphyseal osteochondroma associated with dysplasia epiphysealis hemimelica (Chekofsky et al. 1979), cartilage-containing mesenchymoma (Dorfman et al. 1980), periosteal chondroma (Boriani et al. 1983), and tumoral calcinosis (Boskey et al. 1983).

Recurrences are rare, having been reported only by Enneking (1983), and there is no recorded malignant transformation of soft tissue chondroma. A marginal excision is sufficient for cure.

References

Boriani, S., Bacchini, P., Bertoni, F. & Campanacci, M. (1983) Periosteal chondroma. *J. Bone Joint Surg.* **65**-A, 205–212.

Boskey, A. L., Vigorita, V. J., Sencer, O., Stuchin, S. A. & Lane, J. M. (1983) Chemical, microscopic and ultrastructural characterization of the mineral deposits in tumoral calcinosis. *Clin. Orthop.* **178**, 258–269.

Chekofsky, K. M., Scott, W. N. & Fielding, J. W. (1979) Epiphyseal osteochondroma of the anterior cruciate ligament. *Clin. Orthop.* **139**, 86–87.

Das, A. K. & Mukherjee, D. R. (1978) Giant osteochondral loose body of the knee joint. A case report. *J. Bone Joint Surg.* **60**-A, 559–560.

Dorfman, H. D.. Levin, S. & Robbins, H. (1980) Cartilage-containing mesenchymomas of soft tissue. Report of two cases. *J. Bone Joint Surg.* **62**-A, 472–475.

Enneking, W. (1983) *Musculoskeletal tumor surgery.* Vol. 2, pp. 999–1002. Churchill Livingstone, New York.

Holstein, A., Lewis, G. B. & Schulze, E. R. (1963) Heterotopic ossification of patellar tendon. *J. Bone Joint Surg.* **45**-A, 656–657.

Jaffe, H. (1958) *Tumors and tumorous conditions of the bones and joints*, pp. 558–575. Lea & Febiger, Philadelphia.

Kautz, F. G. (1945) Capsular osteoma of the knee joint. Report of four cases. *Radiology* **45**, 162–167.

Milgram, J. W. & Dunn, E. J. (1980) Para-articular chondromas and osteochondromas: a report of three cases. *Clin. Orthop.* **148**, 147–151.

Milgram, J. W. & Jasty, M. (1983) Case report 238. *Skel. Radiol.* **10**, 121–125.

Mosher, J. F., Kettelkamp, D. B. & Cambell, C. J. (1966) Intracapsular or para-articular chondroma. A report of three cases. *J. Bone Joint Surg.* **48**-A, 1561–1569.

Robillard, G. L. (1941) Ossification of infrapatellar bursae and fat pad. *Am. J. Surg.* **51**, 442–444.

Roth, P. B. (1944) Ossifying chondroma replacing the infrapatellar pad of fat. *Proc. R. Soc. Med.* **37**, 279–280.

Sarmiento, A. & Elkins, R. W. (1975) Giant intra-articular osteochondroma of the knee. A case report. *J. Bone Joint Surg.* **57**-A, 560–561.