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SUB-PERIOSTEAL GANGLIA

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Ganglia or synovial lined cysts are ubiquitous. Seymore (1968) and Crabbe (1966) both reported cases of intraosseous ganglia. Woods (1961) described seven cases of synovial lined cysts in close relationship to normal joints and Fisk (1949) described a case of recurrent ganglia of the tibia producing radiological absorption of bone. Carp & Stout (1928) mention that ganglia located in the periosteum have been reported and Byers & Wadsworth (1970) report four cases.

CASE HISTORY

A 36-year old male presented in clinic complaining of swelling and aching of the right leg. Six years previously he had noticed a small swelling about the size of a pea two fingers below the tibial tubercle on the subcutaneous surface of the tibia. No history of trauma can be recalled and the swelling was ignored until it became painful and swollen and prompted his first attendance at the outpatient clinic. His symptoms rapidly settled down without specific treatment. Over the ensuing years he had no further trouble, but noticed that the swelling gradually increased in size, spreading down the subcutaneous surface of the tibia. His second presentation at clinic was motivated by anxiety as to the nature of the swelling.

Clinically

Clinically there was an irregular swelling some 5 cm long and of 2.5 cm wide over the upper part of the subcutaneous surface of the tibia. This swelling was not attached to the skin, did not subside with pressure or elevation of the leg and was fluctuant in parts. No glands were palpable in the groin and pulses in the leg were normal.

Investigations

E.S.R., Latex Test for rheumatoid arthritis, serum uric acid, and white cell count were all normal. X-ray of the tibia showed no evidence of bone cysts.

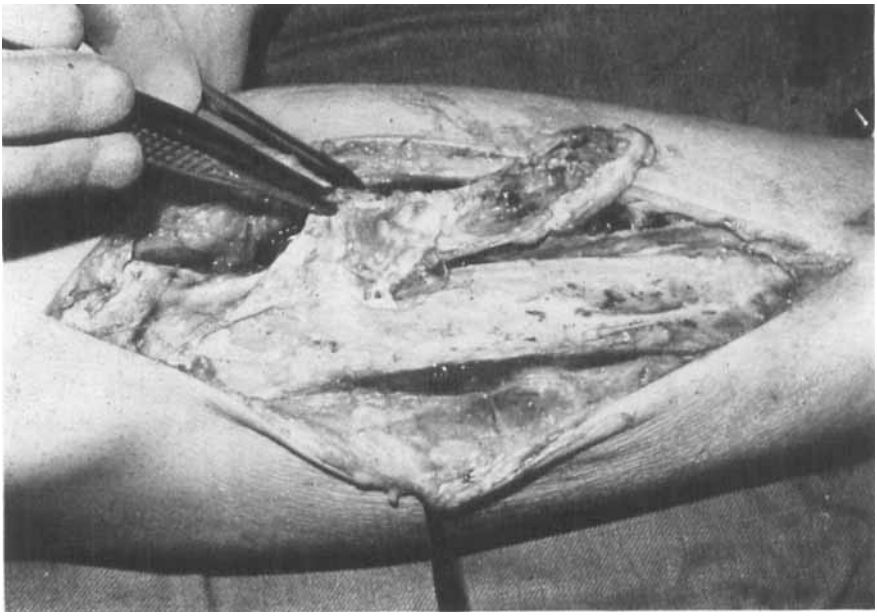

Figure 1. Strip of periosteum containing multi-loculated cysts being removed from subcutaneous surface of tibia.

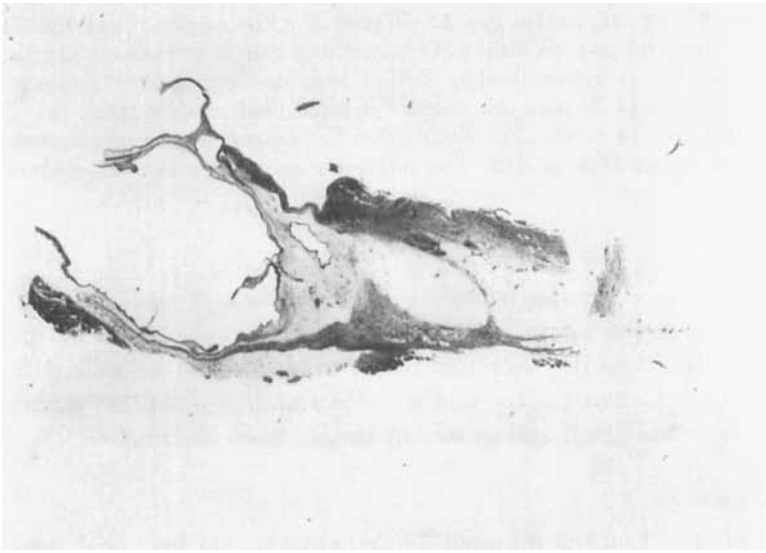

Figure 2. Histology. Section of specimen (× 6) showing large cystic area and several smaller cystic areas in thickened periosteum.

Operation

Through a longitudinal incision the swelling was exposed and found to be a series of multi-loculated ganglia of varying size and containing typical ganglion fluid. These cysts arose from the deeper layers of the periosteum and lifted it off the tibia. Some of the larger cysts had produced small pressure indentations in the tibia, but at no site was the tibia actually invaded. No communication with the knee joint or the superior tibio-fibular joint was found on exploration. A segment of periosteum with the attached cysts some 15.5 cm long and 3.7 cm wide was excised and the wound closed.

Post-operatively

Post-operatively there were no complications and there has been no further recurrence at follow-up eighteen months later.

DISCUSSION

Since the time of Ellers (1746) the aetiology and nature of ganglia has been in dispute. Initially believed to be due to a herniation of joint cavity or tendon sheath, Clarke (1908) regarded them as cystic neoplasms of connective tissue origin. Campbell (1963) notes that some ganglia are discrete cysts lined with synovium and attached by a pedicle to synovial sheaths, whereas others are poorly circumscribed, lack a well-defined lining and are usually found in the vicinity of large joints. The origin of such ganglia has been attributed to displaced synovial tissue; the extravasation of mucin into the periarticular tissues, or due to mucoid degeneration in connective tissues. The fibroblasts produce intercellular mucin which forms pools that coalesce to form one or several cysts. The surrounding tissue is compressed by the accumulating fluid, but there is also a fibroblastic prolification and collagen formation which results in a fibrous wall.

The findings of synovial cysts within bone whose nearby joints were not diseased produced yet more speculation. Crabbe (1966) regards intraossesous ganglia as comparable with other ganglia, points out the close histological similarity, and states that intraosseous ganglia develop in close relationship to the insertion of ligamentus structures in bone.

However, Fisk (1949) reports the case of a 44-year-old airman with radiological evidence of reabsorption of the tibia which was due to a recurrent ganglion. He concluded that in his case the ganglion had

arisen from the periosteum and caused erosion of the bone before bursting into the subcutaneous tissue and presenting clinically.

However, in one case where the underlying bone was examined histologically, Byers & Wadsworth (1970) demonstrated that bone is not always reabsorbed beneath a periosteal ganglion and may react by producing new bone.

The possibility of synovial bone cysts being derived from metaplasia of bone, as suggested by Hick (1956), cannot be excluded and gains support from Byers & Wadsworth who state that "the lesions in bone seem to depend in the first instance on the development of focal marrow fibrosis within which the degenerative process takes place". Nevertheless, intraosseous ganglia in bone near osteoarthritic joints may be due to the extrusion of synovial fluid from the joint through microfractures (Landells 1953). The recognition of ganglia arising from the periosteum and producing pressure indentation on the bone below raises the possibility that some intraosseous ganglia may arise from the periosteum.

This appears to be a reasonable hypothesis when Fisk's case is considered in conjunction with the case described above, and is reinforced by the illustration of the intraosseous ganglia shown by Seymore which has a well-developed stalk. It is therefore suggested that intraosseous bone ganglia may also arise from the periosteum under the stimulus of factors yet unknown. Enlargement of the cyst can cause pressure absorption of the bone below the cyst, which gradually sinks into the bone, eventually loses its connection with the periosteum, and thus appears to be a truly "intraosseous" ganglion.

SUMMARY

A patient with a sub-periosteal ganglion presenting as a multiloculated subcutaneous cystic swelling over the shaft of the tibia is described. No connection between the surrounding joints and the ganglion was found at operation. The aetiology of ganglia is briefly reviewed and three mechanisms whereby intraosseous ganglia may arise are discussed.

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