GIANT-CELL GROWTH OF BONE AND TENDON SHEATH

GIANT-CELL SARCOMA, BENIGN MYELOMA, ETC.

By Leonard W. Ely, M.D.

of San Francisco

(From the Stanford University Laboratory of Surgical Pathology)

Giant-cell growths in bone and also in tendon sheaths are fairly frequent. In a rather thorough search I have not found a case in which bone and tendon sheaths were involved in the same patient. Following is the history:

Mrs. D., aged twenty-seven, March 15, 1916. The patient has been married eight years, and has one child eight weeks old. She has had no miscarriages and has always been healthy. She sprained her right ankle three years ago, and the injury was followed by complete recovery. One year ago she sprained the ankle again. It has been painful ever since, and somewhat swollen, although it did not grow much worse. Four months ago it was sprained again. Since the birth of the baby the patient has been much worse. She has been on her feet more. She is nursing the baby and is feeling well, but thinks she has lost weight during the past week. She gives no history of sore throat, and her husband denies lues.

Examination.—The patient limps. She has a rounded, obscurely elastic swelling of the lower end of the right fibula, somewhat sensitive to firm pressure, but not accompanied by any inflammation. A small, rather firm swelling is present below the lateral malleolus, not connected with the main tumor. The veins are dilated over the swelling.

The X-ray picture shows a marked enlargement of the bone, with thinning of the cortex.

Operation (March 17).—Esmarch bandage. The incision was a longitudinal lateral one over the lower end of the fibula, laying bare the very thin shell of bone. This thin shell was opened, and some of the contents were scooped out. They correspond to the description ordinarily given of giant-cell tumors, except that they were more reddish brown than red.

Professor Ophüls made a frozen section of the material, and pronounced the growth a giant-cell sarcoma. The incision was then prolonged distalwards, over the small mass below the malleolus. This mass, about the size of a bean, firm and rather elastic, was dissected from the peroneal tendon sheath, and the sheath was opened in the operation.

The cavity in the fibula was then scooped out thoroughly, and the thin lateral shell of bone was removed. Two more fairly large masses were discovered, and were dissected from the peroneal muscle and tendon sheath immediately behind the bone tumor but apparently not connected with it or with the other growth dissected from the tendon sheath. The cavity in the bone was swabbed out with alcohol and

FIG. 1.—Skiagram of growth in fibula.

FIG. 2.—Photomicrograph of slide from growth 1 in tendon sheath, showing several giant cells. Note particularly the shape and size of the one in the centre of the field. Zeiss objective E.

FIG. 3.—Low power photomicrograph of small growth 2 in tendon sheath, enlarged about 8 diameters. Note capsule.

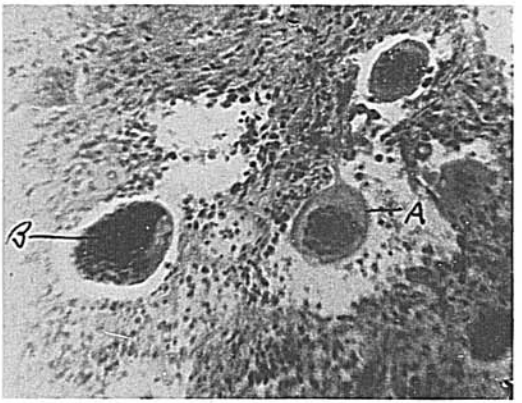

FIG. 4.—Photomicrograph of slide from growth 3 in tendon sheath. Observe the process on giant cell *A* and the dense mass of deeply staining nuclei on *B*. Zeiss objective E.

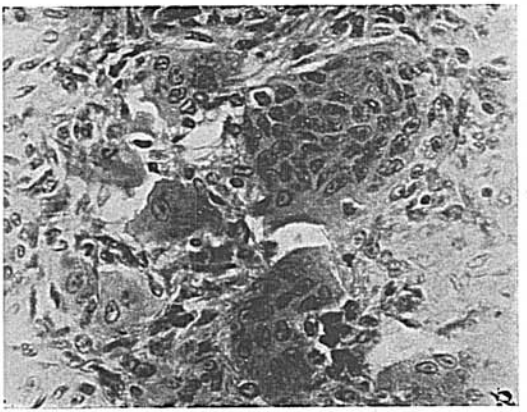

FIG. 5.—Photomicrograph of growth in bone. High power.

carbolic acid, the wound was sutured in two layers, and the foot was put up in plaster of Paris. The layer of bone on the medial aspect of the fibula was not disturbed; hence the mortise of the ankle-joint remained as before.

The contents of the tendon tumors were similar to the contents of the bone, except that they were yellowish brown in color. The largest one of the three was the proximal one.

Histology.—1. Growth in tendon, below the lateral malleolus. A well-defined capsule is present, except on one side. Running in from one section of the capsule is a small wedge of osteoid trabeculæ with its base at the capsule. In several places the growth is making its way through the capsule.

The growth itself consists of a delicate stroma of fibrous tissue with an abundance of spindle cells (fibroblasts) and many giant cells. The giant cells vary greatly in shape and in number of nuclei. Some of the nuclei stain fairly sharply, and have a smooth outline and a well defined nucleolus. Some stain poorly, and have a dentated outline. Many are dead, and appear as granular collections. Scattered through the growth are many endothelial leucocytes.

The giant cells are irregular in outline, without a limiting membrane, and are composed of hyaline or faintly granular material. They look as if they had arisen from the fusion of a number of endothelial leucocytes, with a subsequent degeneration of the cell body.

A few blood-vessels are present and many larger or smaller clefts containing blood pigment.

2. The small growth in the tendon sheath, posterior to the growth in the bone, differs from it in having a capsule more nearly complete. It contains also a few trabeculæ of osteoid tissue. Here and there one can see a large, clearly defined cell containing many small, round, deeply staining nuclei. It stands out in sharp contrast to the other giant cells. Its cytoplasm also stains more deeply.

3. The large growth situated just distal to No. 2 is similar to it. It also contains a few minute trabeculæ of osteoid tissue, and in places shows hemorrhage into the tissue of the growth itself.

4. Material removed from the bone tumor shows a delicate stroma of fibrous tissue, with masses of spindle cells and many giant cells similar to those described in the tendon growths, but not so large. A few thin-walled blood-vessels are present in the fibrous stroma, but the clefts described in No. 1 are not present. On the other hand, hemorrhage has been free into the mass. A few small osteoid trabeculæ are present, but no normal marrow tissue.

NOTE.—A letter from the patient on August 14, 1918, 29 months after the operation, says that she is in health, does her own housework, and suffers no pain or disability. There are no signs of the return of the growth.

The nature of these giant-cell growths has occasioned considerable discussion, and has not yet been definitely settled. Until comparatively recently, when found in bone, they were regarded as malignant, and were treated by amputation. Even as late as 1913, Stewart still maintained their malignancy. Barrie considers that they are due to hemorrhage in the marrow, and calls the disease hemorrhagic osteomyelitis. Adami, Mathews and others view them as myelomata. They occur preferably in young adults of from

twenty to forty years, and usually in the ends of the long bones or more rarely in the small bones. In other words, they are located preferably where lymphoid marrow is present. They show no tendency to involve the joint.

Almost all recent writers (with the exception of J. C. Stewart) say that when they are thoroughly removed, they do not recur, or, if they recur, that they may be removed again without any fear of metastasis. Bloodgood insists upon the importance of swabbing out the cavity in the bone with carbolic acid, but as to the actual necessity of this there is doubt, for no bacterial growth ever has been demonstrated in them. They replace practically all the bone and normal marrow tissue at the site of growth. The cortex over them becomes thin and expands, and, when of great thinness, crackles on pressure—"egg shell crackling." The growth does not often perforate the cortex and involve the surrounding tissues.

A history of trauma is often obtained, but whether the trauma is the cause of the disease or an effect, has not been determined.

The contents of the giant-cell tumor in bone are usually characteristic—friable, and yet with more or less cohesiveness, "currant jelly" in color, often with mottled areas of fibrous tissue. They can be scooped out easily.

No tendency to spontaneous cure has been noted, nor any tendency to secondary infection unless produced by unwise operative measures.

Giant-cell growths of tendon sheaths have also occasioned considerable discussion. Fleissig thinks they are granulomata. Others call them sarcomata. Generally they run more to a yellowish color than to red.

Histologically, giant-cell growths consist of a delicate stroma of connective tissue, with spindle cells and giant cells. Some writers, *e. g.*, Mallory, view these last as foreign-body giant cells, others (Adami, Mathews) as true myeloplaxes. In this case of mine they looked entirely unlike the typical myeloplax, but distinctly like the giant cell of a granuloma. In fact, many of them have no likeness to a cell, and are only called giant cells from custom. They would be described more properly as a collection of nuclei surrounded by an irregular mass of hyaline or faintly granular material. The appearance of the growth in this case is distinctly that of a granuloma.

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