TRANSACTIONS

OF THE

PHILADELPHIA ACADEMY OF SURGERY

STATED MEETING HELD NOVEMBER 3, 1930

The Vice-president, Dr. John Speese, in the chair

Calvin M. Smyth, Jr., M.D., Recorder

PRIMARY GIANT-CELL TUMOR OF THE PATELLA

Dr. Leonard G. Dobson (by invitation) reported the case of a man aged twenty-four who was admitted in the orthopædic service of Dr. A. B. Gill in the Hospital of the University of Pennsylvania January 28, 1930 complaining of pain and swelling of the right knee. A year previous to admission he had fallen, striking his acutely flexed right knee on the pavement. He felt something snap in his knee and had severe pain when moving his leg. The knee was strapped but had remained swollen and tender ever since. For several months previous to admission he had noticed that the right knee cap was getting larger, was hot to the touch and that motion of the leg, especially extension, was painful. When admitted the right patella was enlarged, smooth and the skin over the patella was red and hot to the touch. Pressure upon the patella was very painful. Repeated studies of the blood and urine were negative for pathology and the blood Wassermann was negative in all antigens. Old tuberculin intracutaneously was negative for reaction for .1 milligram in twenty-four and forty-eight hours.

A röntgenogram of the knees taken January 13 showed that there had been an old fracture through the right patella. In addition there is now considerable rarefaction and some tendency to trabeculation of the patella. This appearance is rather unusual for a simple fracture of the patella.

At operation January 30, by Dr. A. Bruce Gill, the vessels about the patella were found congested. The patellar ligament was elevated subperiosteally and there was free bleeding from the congested veins. The cortex of the patella was firm but when a small piece of the cortex was removed the patella was found to be a shell filled with blood and dark material which resembled degenerated blood clots. The soft, spongy material was carefully curetted out. The interior of the patella bled very freely and was packed with gauze to control the hæmorrhage; the anterior portion of the cortex was crushed in and the wound closed, leaving the end of the gauze packing extending out of the wound. A posterior plaster splint was applied.

Culture of the material removed from the patella revealed no growth except a few diphtheroids. Dr. Herbert Fox reported on the microscopic examination of the tissue as follows: "Within a mass of blood was found a piece of tissue showing giant-cell tumor of bone, suggestive of sarcoma be-

cause of the irregularity and indefiniteness of the blood spaces. Examination of the decalcified bone from the cortex shows some rarefaction, fibrillary bone formation and masses of pigment, but no tumor was found."

Following the operation the patient made an uneventful recovery. The gauze packing was removed on the second day after the operation. The posterior splint was left on for six weeks after operation, being removed for dressings. Examination March 12 showed the patient able to walk but there was still some tenderness over the patella. X-Ray examination at that time showed: "Marked improvement in the right patella since last examination as indicated by considerable new bone formation. There is still some rarefaction."

Follow-up on the patient ten months after operation found him com-

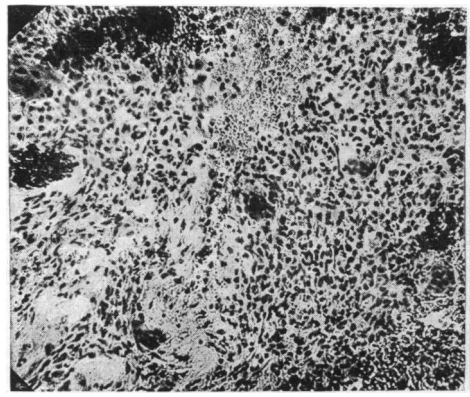

FIG. 1.—Low power photomicrograph of the tumor tissue (x 250) showing chronic inflammation, bone spicules and giant cells.

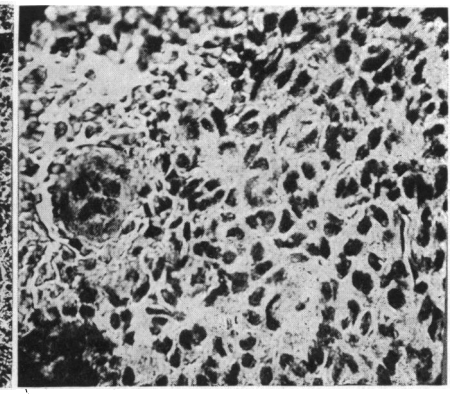

FIG. 2.—High-power photomicrograph (x 700) of the tumor tissue. Shows the very cellular cytoplasm.

pletely recovered and in excellent health. The right patella was no longer tender and was about the size of the left.

The reporter stated that tumors of the patella are very rare. Cole[1] in 1925 reported the first benign cyst of the patella. He surveyed the literature, both American and foreign, and found twenty-four other cases of primary tumor of the patella. These included all the common tumors of bone except myxoma. In these twenty-five cases were included three cases of giant-cell tumor of the patella. In 1924 Faltin[2] reported a case of giant-cell tumor of the patella which had not been included in the three reported by Cole. King and Towne[3] in 1929 reported the fifth case of giant-cell tumor of the patella. The case being reported is therefore the sixth case of primary giant-cell tumor of the patella recorded in the literature.

Giant-cell tumor is the term now generally used to designate a specific tumor. The condition has variously been called giant-cell sarcoma, myeloid sarcoma, hæmorrhagic osseous dystrophy, myeloma, osteitis fibrosa with giant cells and chronic hæmorrhagic osteomyelitis.

Lebert[4] is credited with first recognizing the condition in 1845. He noted

the giant cells in certain medullary tumors but did not at first separate the benign giant-cell tumor from malignant sarcoma of bone. Robin,[5] in 1850, described certain benign tumors of bone which contained many giant cells. Paget[6] further described the condition in 1853. In 1860 Nélaton[7] wrote a monograph on the subject describing the reddish, jelly-like appearance of the tumor tissue. He noted its capacity to absorb bone and widen the marrow cavity and fully established its benign course and the wisdom of conservative treatment. In 1879 Gross[8] presented the results of the study of seventy cases of giant-cell tumor and also emphasized their benign nature.

Although many writers had emphasized the benign nature of giant-cell tumors most of the surgeons treated the condition as malignant and employed radical treatment until Bloodgood[9] in 1910 again pointed out their benign nature. In 1920 Bloodgood[9] reported forty-seven cases of giant-cell tumor in none of which had metastasis occurred. Codman[11] in 1925 reported that 100 cases of giant-cell tumor had been registered without a true case of metastasis. Stone and Ewing[10] in 1922 held that rarely if ever does a true giant-cell tumor metastasize. Cole[1] in 1925 stated that giant-cell tumors are benign and could be cured by curettement followed by cauterization.

Authors do not share the opinion that all giant-cell tumors are benign. Coley[12] in 1924 presented an analysis of fifty cases of giant-cell tumor and found that metastasis had occurred in nine. In 1927[13] he reported follow-ups on fifty cases, included nineteen new cases and reached the conclusion that, "It is not always possible to differentiate the malignant from the benign cases by the clinical Röntgen-ray and microscopic data. Giant-cell sarcoma, or 'giant-cell tumor' as it is designated by most pathologists today while in the great majority of cases, a benign or at least only locally malignant lesion, should still be classed as a sarcoma since in certain cases it has all the clinical features of a malignant bone tumor causing death by metastases."

Chatterton and Flagstad[14] in 1927 reported two cases which had been diagnosed giant-cell tumor microscopically which developed malignant changes.

Single giant-cell tumors are not uncommon. The literature contains reports of several hundred cases. In 1927 Alexander and Crawford[15] reported a case of multiple giant-cell tumors and included a summary of twenty-four such cases collected from American and foreign literature.

Giant-cell tumors most often appear at the ends of the long bones, where, according to Christensen,[16] "there is an epiphyseal disc of maximal growth, where the growth period is longest and where the natural growth momentum is greatest." They also arise in the maxillæ (epulis type) and according to Ewing[10] very similar tumors occur in the capsules of joints and along the tendon sheaths and bursæ.

In the long bones giant-cell tumors produce reddish, jelly-like masses resembling granulation tissue and replacing the cancellous portions of the bone. The tumor may expand the shaft of the bone with the periosteum laying down an advancing shell of new bone. The shell of bone may be-

come so thin that it will crackle. The centre resembles splenic tissue except it has a firmer opaque cut surface and the central cystic areas are soft and infiltrated with blood. The outer bony shell may become thin and allow passage of the tumor tissue but there is seldom any tendency toward invasion of soft parts.

Giant-cell tumors are characterized by the abundance of large giant cells containing many small, separate oval nuclei. The tumors are believed to take origin from the fibrous tissue framework of bone, either from the periosteum or endosteum. The etiology of this type of tumor is obscure but it is quite well established that trauma is the most common cause of single lesions. The classification of giant-cell tumor is unsettled; some claiming it is inflammatory, others neoplastic, and still others that it is a mixture of the two. Alexander and Crawford[15] state that, "It is generally considered as resulting from some chronic irritation, which may follow a metabolic disorder." They further account for the development of the condition as follows: "The inflammatory proliferation of tissue is then essentially a regenerative process which has for its aim the compensation of the lesion produced by the cause of inflammation. Under special conditions this leads to a hyperplastic proliferation of connective tissue, frustrates its own aim and causes new damage. This is particularly the case when, as a result of the inflammation in the organism, there is kept up a permanent condition of inflammation. The bone tissue thus replaced by cellular tissue softens and produces multiple bone cysts lined with fibrous tissue and filled with clear fluid, fibrocystic osteitis, or within the fibrous tissue lining the giant-cell tumor develops."

Giant-cell tumors grow slowly, do not metastasize, appear trabeculated by X-ray and do not produce cachexia. The tumors may be present an indefinite time without giving rise to symptoms and often the occurrence of pathologic fractures is the first indication of their presence.

Diagnosis is based on the history, usually that of trauma; on the characteristic trabeculations by X-ray; and biopsy with microscopic examination.

The treatment generally advocated in cases of giant-cell tumor consists in thorough curettage with or without the application of pure carbolic acid followed by alcohol or with 20 per cent. zinc chloride. If the cavity is large it may be Dakinized, but usually simple packing is adequate. X-ray gives excellent results and numerous cures have been reported. Herendeen[17] in January, 1930, reported three cases of giant-cell tumor that had responded very well to X-ray therapy.

Regarding the rarity of tumors of the patella Christensen[16] states: "The patella seems singularly immune to bone tumors in spite of the fact that it is probably subjected to a far greater amount of trauma than any other bone in the body. It seems reasonable to assume that the immunity to bone tumors which the patella enjoys is probably due to the absence or loss of growth restraint, incident to active diaphyseal growth and pressure epiphyses. The fact that the patella develops from an endochondral center, that it has

a relatively short period of growth, and that it is a sesamoid bone may be of importance."

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DR. A. BRUCE GILL remarked that out of twenty-seven cases reported in the literature this is only the sixth one of a primary growth in the patella. The report from the X-ray department suggested that it might be a giant-cell tumor, but the speaker could not entirely dismiss the thought that it might be a cyst and when he opened the cortex and found a very soft mass, which closely resembled an old blood clot, he thought he was dealing with a hæmorrhagic cyst; free bleeding also suggested that. The mass was so soft it was difficult to get out for microscopic examination.

PHRENIC NERVE EXERESIS FOR LUNG ABSCESS

DR. RICHARD H. OVERHOLT (by invitation) presented a man aged twenty-five, who was admitted in the medical service of the Hospital of the University of Pennsylvania September 14, 1928. He had had a tonsillectomy under general anæsthesia four weeks previously, which was followed in a week's time by pain in the chest, cough, foul expectoration and fever. He had lost sixteen pounds in weight. There were no other symptoms.

Physical examination revealed nothing remarkable except an area in the right chest in the posterior axillary line over which the breath sounds were harsh and occasional râles could be heard. There was a moderate secondary anæmia, the hæmoglobin being 62 per cent. The leucocyte count was 15,400. The Wassermann reaction was negative. Acid-fast organisms were not

present in the sputum. A röntgenogram of the chest revealed an abscess in the lower portion of the right upper lobe, centrally located. Bronchoscopic examination showed mucopurulent material coming from the right upper main bronchus. A smear and culture of this material showed a mixed group of streptococci, staphylococci and micrococcus catarrhalis but no fusiform organisms or spirilla were observed.

Six bronchoscopic treatments were given over a period of four weeks at the end of which time the lesion had progressed in size and had extended to the periphery of the lung (Fig. 3). External drainage was recommended and the patient was transferred October 12, 1930, to the surgical service of Dr. George P. Muller.

An exeresis of the right phrenic nerve was done and this followed in three days by a first-stage thoracotomy by Dr. Selling Brill. A portion of the

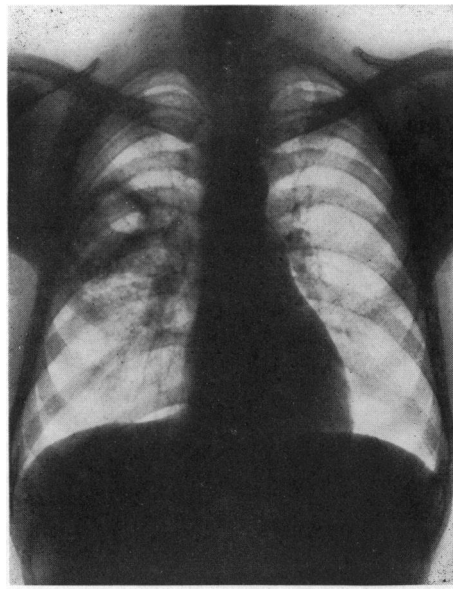

FIG. 3.—Case J. B. Röntgenogram made six weeks after onset of symptoms of lung abscess. Lesion in lower portion of right upper lobe. Note size of lesion and extension to the periphery.

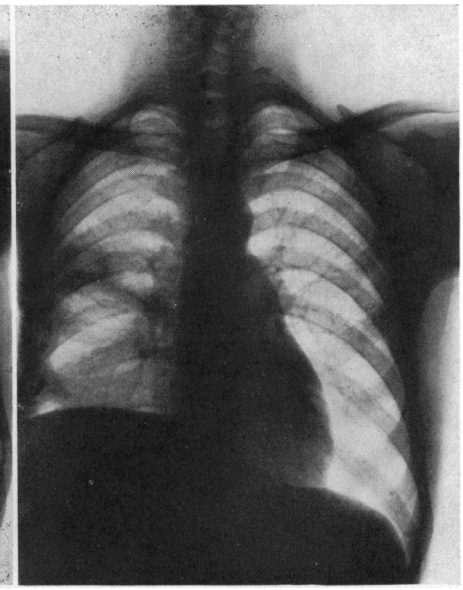

FIG. 4.—Case J. B. Röntgenogram made two weeks after right phrenic nerve evulsion and one week after first-stage thoracotomy. Three inches of the seventh and eighth ribs over the lesion had been removed and the wound packed with gauze. Note diminished size of right thorax due to elevated position of the diaphragm and almost complete disappearance of the lung abscess. Decision not to complete surgical drainage was made at this time.

eighth rib was excised in the posterior axillary line. In the course of the procedure the pleura was injured and an accidental pneumothorax resulted. The lung was immediately reëxpanded by positive pressure anæsthesia and the rent in the pleura closed. A metal marker and gauze packing were placed in the wound. A subsequent röntgenogram showed the marker to be slightly below the abscess so that on October 20 (four days later) Doctor Muller enlarged the thoracotomy opening, resected the next rib above and repacked the wound. Immediately following these preliminary procedures, the patient's cough and expectoration subsided and the temperature dropped to normal. A röntgenogram of the chest October 27 (fourteen days after

phrenic exeresis and seven days after first-stage thoracotomy) showed an almost complete disappearance of the pulmonary lesion (Fig. 4). Because of the clinical and röntgenological improvement, the second-stage operation was not carried out so that actual surgical drainage of the abscess was not done. The patient was discharged two weeks after the last operation with a healed thoracic wound.

The patient was seen in the follow-up clinic one month later. All symptoms and signs of a pulmonary abscess had disappeared. He had been able to resume his former work. A röntgenogram gave evidence of slight fibrosis at the site of the previous lesion. The diaphragm on the right side was elevated and restricted in its movement (Fig. 3). After two years the patient was reëxamined. There had been no recurrence of the lesion and the röntgenogram showed a clear lung field on the right with a persisting diaphragmatic elevation.

The speaker remarked that the points of interest in this case are: (1) The rapid disappearance (two weeks' time) of a large pulmonary abscess during the course of surgical treatment without the necessity of actually draining the abscess; (2) the probable value of phrenic nerve interruption in the treatment of a thin-walled, easily collapsible, pulmonary abscess; and (3) the difficulty of evaluating the effect of the different surgical procedures in this case. The accidental pneumothorax was probably of little moment in that the lung was reëxpanded at the time and a röntgenogram forty-eight hours after operation did not show air in the pleural cavity. The removal of two ribs over the site of the abscess may have released the parietal pleura sufficiently to aid in the collapse of the walls of the abscess cavity which was so close to the periphery. Undoubtedly, most of the diminution in thoracic volume which permitted the walls of the abscess to collapse and obliterate the cavity was due to diaphragmatic relaxation. Because of the rapid disappearance of the pulmonary lesion in this case, the question is raised as to whether permanent diaphragmatic paralysis was necessary. Temporary paralysis by only crushing the nerve might have been sufficient.

ELECTROCAUTERIZATION IN TREATMENT OF HUMAN BITES

Dr. William Bates read a paper with the above title, for which see page 641.

Dr. Hubley R. Owen said that in his work as a Police Surgeon he had had 200 cases of human bites in twenty-three years. In spite of the fact that he has tried every known treatment, he personally feels that he is not getting any better results now than twenty years ago. This same character of wound is received by more or less peaceful policemen making prisoners. Some years ago he reported two chancres developing from wounds of this character. He has not been able to get the same results as Doctor Bates with the cautery, but perhaps did not try it sufficiently. He has tried everything; one of the main things he has had to contend with is internes sewing these wounds up without drainage. He always opens the wounds widely under gas anæsthesia. Exposed metacarpo-phalangeal joints in these cases show rapid destruction

of the cartilage, probably because the impact is one of the cartilage originally and because of the poor blood supply. Infection and ankylosis of the metacarpo-phalangeal joint often occur. One case required amputation. The speaker asked Doctor Bates how far he suggested going with the cautery when tendons were exposed. Doctor Owen is at present treating these cases by wide incision under general anæsthesia followed by continuous immersion in warm boric solution. He will be glad to try electrocauterization again.

DR. JOHN FLICK said that he had been trying to study cases of human bites bacteriologically but unless examination is made very promptly and very carefully the spirochetes are missed; they are difficult to culture and unless the material removed is examined within a half hour the organisms are not found.

DR. M. J. HARKINS remarked that Doctor Bates' success with cauterization might be due to the fact that the severe course of many cases of bites is due to invasion by anaërobic bacteria. Many antiseptics have little if any value in this type of infection and it may be that the severe disinfection of the cauterization is responsible for the cleansing effect.

DR. WILLIAM BATES said that after going over his findings and various reports in the literature about the types of infection, he decided to wait for a few more cases and have them cultured before treating them, but none of these showed the streptococcus fusiformis. Regarding depth of cauterization, he thought one would be justified in carrying it to the point of complete débridement, even though it was necessary to sacrifice a tendon.

COMPARATIVE STUDIES OF ANTISEPTICS IN EXPERIMENTALLY PRODUCED LOCAL INFECTIONS

DRS. ELI SALEEBY and M. J. HARKINS, by invitation, read a paper with the above title.

END-RESULTS IN RADICAL OPERATIONS FOR CARCINOMA OF THE PERIAMPULLAR REGION

DR. GEORGE P. MULLER, and, by invitation, DR. LEE RADEMAKER read a paper with the above title, for which see page 755.

STATED MEETING HELD DECEMBER 1, 1930

The President, DR. GEORGE P. MULLER, in the Chair

CALVIN M. SMYTH, JR., M.D., Recorder

PERFORATED DIVERTICULITIS OF THE SIGMOID

DR. S. DANA WEEDER reported the case of a man, age forty-one, who was admitted to Chestnut Hill Hospital in the service of Dr. William B. Swartley, November 30, 1929. His chief complaint was abdominal pain. Seven days prior to admission he was seized with a dull pain in the left lower abdomen following a meal. The pain was relieved by taking soda, but returned two days later and was not relieved by taking soda. The pain