weakness. The weakness progressively became worse, and within 2 months he completely lost power in the lower limbs.

On examination.—There was complete loss of motor power of both lower limbs with flaccidity, absent tendon jerks, bilateral extensor plantar response, marked blunting to all sensations (touch, pain, temperature & vibration), loss of the sense of position & passive movement, and presence of abdominal reflexes. Speech, intelligence and cranial nerves were intact. The upper extremities showed no neurological abnormalities. And other systems were normal.

Investigations.—Urine, stool and blood were normal. Cerebrospinal fluid—W. R. negative; protein present in fair amount, sugar 35 mg. per cent, chloride 780 mg. per cent. Skiagram of the spine showed irregular osteoporosis of the body of the 12th dorsal vertebra with vertical strands of compact bone running through it. The radiological findings were diagnostic of angioma of the 12th dorsal vertebra (Fig. 3). A myelography was done which revealed complete obstruction in the spinal canal at the level of the 12th dorsal and the 1st lumbar vertebra (Fig. 4). This was suggestive of spinal tumour which very likely was an angioma—the continuation from the involved 12th dorsal vertebra.

Progress.—He was given deep X-ray exposures over the affected spine, dosage being 400r in three sittings (total 1200r). Within about one week the patient felt gradual diminution in the intensity of root pains. The pain which was so severe as to need injections of morphine, left him completely. Gradually he regained power in the lower extremities, and his difficulty in micturition as well as his constipation were over. His perception of sensations returned, but the plantar response remained extensor on both sides. A month after the deep X-ray therapy, a skiagram of the spine was taken and the report was that as compared with the previous skiagram there was some consolidation in the texture of the body of the 12th dorsal vertebra. Another course of deep X-ray (total 1200r) was given. He had an uninterrupted progress, and he became able to walk about with the help of a stick; and his plantar response became flexor on both sides. A skiagram, taken 6 weeks after the second deep X-ray therapy, revealed further consolidation of the body of the affected vertebra. He was discharged from the hospital after a stay of about 5 months with very slight disability still left. He was re-admitted after about 8 months, when he said that he was leading an active life and earning his bread. A skiagram of his spine was taken, and it showed that the structure of the angiomatous vertebra (12th dorsal) was more consolidated indicating a very good progress radiologically. (Fig. 5). He was given another course of deep X-ray (total 1200r), and was discharged. He was re-admitted 13 months after his first discharge from the hospital and was found to be perfectly fit except the only complaint that he could not run as fast as he could do before he became diseased. A skiagram of his spine revealed that the angiomatous vertebra was well consolidated, but its calcification appeared to be slightly less than that in the previous skiagram. (Fig. 6). Hence another course of deep X-ray (total 1200r) was given to him, and was discharged. He has been advised to report to us every 3 months.

Summary

A brief description of angioma of the vertebra has been given. Two cases of the same has been reported with their response to deep X-ray therapy. One of the cases complained of pain in the back, which started after a fall; and the other presented symptoms of spinal tumour. The response of the complete disability of the second case to deep X-ray was very successful.

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PLASMA CYTOMA

By N. GUPTA, M.B., M.R.C.P., D.T.M.

Department of Pathology, Assam Medical College, Dibrugarh, Assam

THE bone-marrow tumour was recognised by Von Rustizky in 1873 and was called by him as "Myeloma". The growths are primarily in the bone-marrow, which characterise the majority of myelomas and are classified among the bone tumours (Ewing, 1946). The authors like Lubarsch (1906, 1907), Pappenheim (1907) regard plasma-cytomas as closely allied to the leukemias and to diseases of the organs in general.

Two types of myeloma are commonly recognised, the one is myeloid myeloma consisting of primitive granulocytes and the other is plasma-cell myeloma, composed of plasma cells. The latter, what is also known as plasmacytoma, is much the commoner variety. This tumour arising in the bone-marrow form multiple nodules accompanied usually by local absorption of bone, producing an early recognizable X-Ray picture, spontaneous fractures are of common occurrence because of the bone absorption.

The disease is one of adult life between the age of 40 and 60 and is commonly seen in men. It is characterised by severe pain from softening and deformity due to the rarefactions of bones from the growth within the marrow. About 75 per cent of cases show some form of nephritis and Bence Jones protein in the urine. The X-Ray appearances are fairly characteristic and manifest multiple osteolytic foci which are hazy and rounded in outline. The bones chiefly affected are the ribs, sternum, vertebræ and flat bones and occasionally the long bones.

Solitary plasmacytoma has been described but in most cases the generalised form developes if the patient has lived long enough. Leukæmia is usually absent. It is difficult to understand why the cells do not pass into the circulating blood and what factors prevent the development of an ordinary Leukæmia. Plasma cells have been described to have been found in the circulating blood in cases of typical myeloma (Beck and McCleary, 1919). Recently records of 25 cases of plasma cell leukœmia have been collected from the literature by Meyer, Halpern and Ogden (1945). These authors believe that the reported cases of plasma-cell leukœmia represent cases of multiple myeloma with an associated leukœmia.

Pathology

Plasmacytomas are usually soft to the touch but they may also be moderately firm in consistency. They are greyish in appearance. The cells are usually plasmacytes, large oval cells, whose nucleii lie eccentric in the basophilic cytoplasm. There is a perinuclear clear zone in which are placed clumps of chromatin which is also contained in the nucleus and has a cart-wheel appearance. As a rule mitotic figures are rare.

Case record

J. aged 40 male, was admitted in the Assam Medical College Hospital on the 9th January, 1951 with a letter from a medical officer of a Tea garden. He had a history of fall about a year back, in 1950, while working in the Tea factory and thereafter complained of pain in his left hip-joint, but there was no manifestation of injury due to this fall. He was admitted into the Tea garden hospital and was thought to be a case of osteomyelitis because of the history of injury, pain and fever, and treated accordingly. He apparently improved with this conservative treatment but the symptoms started again after 15 days. The pain was less but a slight rise of temperature continued. He was readmitted into the garden hospital and was diagnosed this time as a case of tuberculous disease of the joint. He was further examined by a specialist of the Tea garden hospital who X-rayed him and diagnosed the case as a giant-cell tumour of the left ilium.

Complaints

Pain in the inner aspect of the left thigh and inability to walk properly, duration about a year.

Clinical findings

The patient was of moderate built. He was limping but there was no shortening of the limbs. The gluteal fold on the left side was flattened while the inner aspect of the upper part of the thigh was swollen and tender on pressure. All movements were free.

Examination of Blood : Hæmoglobin—60 per cent, red cell count—3,700,000 per c.mm., white cell count—6,700 per c.mm., *Diff. count:* polymorphs—67 per cent, lymphocyte—32 per cent, monocyte—nil, eosinophils—1 per cent, Bone marrow reaction—normoblastic to both erythocytes and leucocytes. E.S.R. (Wintrobe)—end of 1st hour—3 mm.; end of 2nd hour—5 mm. Kahn negative; *Urine*—Bence Jones protein—negative.

Biopsy.—A piece of tissue was taken by an oblique incision 4″ from about 1″ medial to the pelvic spine lateralwards to the upper part of the thigh. A piece of superior ramus was chiselled and sent for histological examination.

Biopsy report : Large number of round cells differently arranged with little intercellular matrix. The cells are mostly plasmacytes—large oval cells of which the nucleus lies eccentric and having basophilic cytoplasm. The matrix in some shows hyaline degeneration. No giant cell or osteoid tissue seen (see Plates XII and XIII, Figs. 1, 2 and 3). A case of plasmacytoma is confirmed by Unna-Pappenheim pyrenin methyl green strands of bony tissue lying in between, presenting a trabecular appearance suggestive of osteo-clastoma of extensive type. Head of femur is dislocated medially into the pelvis (see Plate XIII, Fig. 4). After the biopsy report was received, the patient was again sent for X-ray examination of the different portions of the body and further radiological report confirmed the histological diagnosis and revealed a typical punched excavation in the skull (see Plate XIII, Fig. 5) and the radiologist diagnosed this as expression of multiple myeloma and changed his former diagnosis of osteoclastoma.

Discussion

The case was first diagnosed as osteomyelitis because of the history of injury, pain and fever. When the symptoms and signs increased and the left joint was involved, the case was then diagnosed as tubercular hip. This diagnosis was again changed to osteoclastoma after the case was X-rayed, but the correct diagnosis could only be made after biopsy report. Further X-ray examination confirmed the biopsy report.

Multiple myeloma is a tumour of the bone-marrow. The nodules are usually multiple and their growth is accompanied by local absorption of bone. This malignant disease is attended by symptoms of pain and anæmia as in this case. The myeloma cells may gain entrance into the circulating blood and may be identified by staining blood smears, but in this case no such myeloma cells could be detected in the blood smear. Hyperproteinæmia due to increased globulin could not be detected in this case and Bence Jones protein did not appear in the urine. Roentgenographic examination reveals multiple, small and large areas of bones destruction which are unaccompanied by proliferative reaction. These appearances are apt to be mistaken for osteoclastoma. Punched areas are well demonstrated in the X-ray of the skull in this case. Ewing's tumour of blood, a myeloma derived from endothelium (endothelial myeloma, diffuse endothelioma of bone) is seen in children and young adults. The patient complains of pain in the affected area. Swelling may or may not be present. Ewing's conception of this histogenesis as endothelial myeloma has been doubted. The growth in the present case which started in the medullary cavity, is highly osteolytic with no evidence of any bone production.

Jaffe and Lichtenstein (1942) hold that the Ewing's tumour is probably derived from the reticular tissue of the marrow. X-ray examination of the entire skeleton reveals but one bone lesion mostly in the middle portion of the shaft of a long bone but in multiple myeloma there are many. Neither the "onion skin" with certain amount of destruction as found in X-rays of Ewing's tumour could be seen in multiple myeloma. Myelocytic myeloma has been described consisting of all the cell types seen in the marrow. Erythroblastic myeloma has also been described but it is doubtful whether these tumours should be included in this category. Various considerations support the opinion that multiple myeloma is a systemic disease and not confined to the bone-marrow alone. Hæmic Reticulosis (Leukaemias) is now regarded as systematised hyperplasias of hæmopoietic tissue. The tumour is derived from primary medullary reticulosis and may be multiple, discrete or diffuse. Extra-osseous metastases have been described by several authors (Battaglia, 1928; Geschiekter and Copeland, 1928). They have been sometimes wrongly diagnosed as lymphosarcoma. It appears that there are gradations similar to those of the so-called lymphomas. They may be single or multiple, relatively benign or highly malignant, or in rare instances may be associated with a leukæmic blood picture.

The functions of the lymphocytes and the plasma cells are still a matter of opinion and no definite opinion can be given. It is generally held that the plasma cells are derivatives of lymphocytes and in certain stage of the development of plasmacytoma they may consist of lymphocytes only and may be diagnosed as lymphomas. Other observers held them as a type of cell *sui generis*. Another view is that the plasma cells originate from marrow reticulum cell and the lymphocytes from lymphoid reticulum cell. It is now possible to identify this type of cell and its ancestor. Ill-defined group of tumours such as multiple myelomatosis, Ewing's tumour, Hodgkin's disease and Hodgkin's sarcoma have all their origin from the primitive mesenchyme which has undergone further differentiation. The multiple myelomatosis develops probably from lymphoblastic or lymphocytic reticulum in which the cells may form plasma cells and must of the hæmopoietic marrow may be involved. The tumour masses may be quiescent for a long time in bones in the primary site or the marrow may reveal predominance of the cells composing the clinically manifested tumour, the disease generalising in its terminal phase. The reticule—sarcomata differ from the systematised reticule-endothelial hyper-plasias and show numerous mitoses and nuclear hyperchromatism. The reticulo-endothelial hyperplasias—retain the character to be multifocal in the organs of the reticulo-endothelial system and thus in the advanced stage of the disease many of the limph nodes as well as the hæmopoietic bone-marrow may be affected.

Prognosis is most uncertain. The patient may remain well for some years; and then may develop a recurrence. The tumour may appear to be slowly growing as no apparent cure can be ensured by appropriate treatment. The danger of recurrence or development of metastases several years later is also great.

Acknowledgement

My thanks are due to the Principal and Professor of Surgery, Assam Medical College, Dibrugarh, for permission to use the hospital records.

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PLATE XII

PLASMACYTOMA. PAGE 270

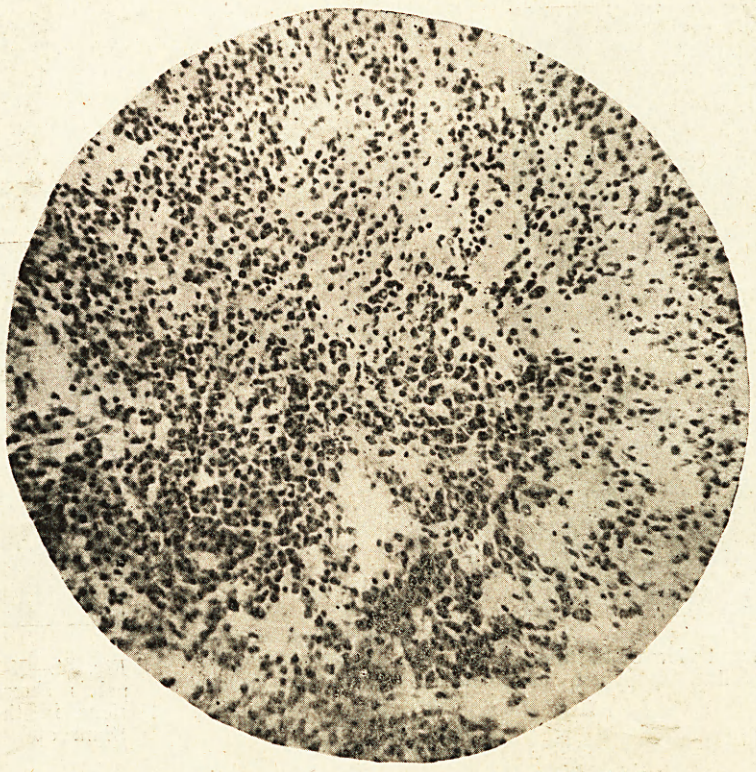

Fig. 1.—Low power view of the plasmacytoma showing large oval cells with eccentric nucleus. No giant cell or osteoid tissue seen.

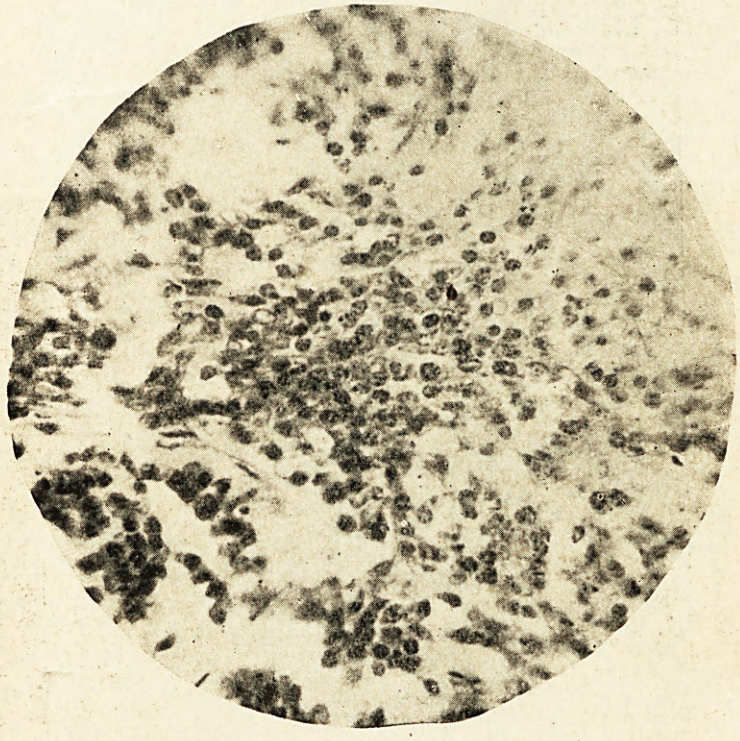

Fig. 2.—High power view of the tumour tissue.

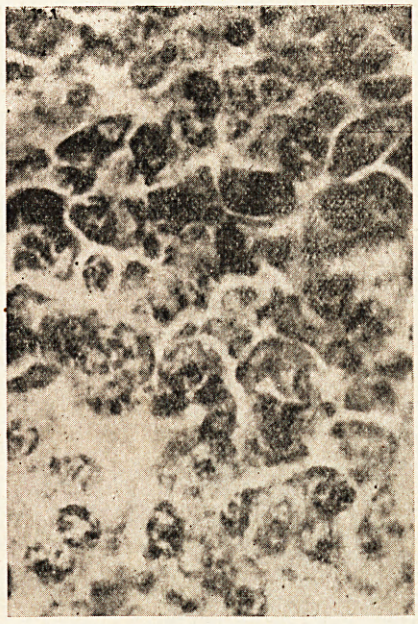

Fig. 3.—Very enlarged view of the tissue cells.

Fig. 4.—X-Ray picture of the pelvis showing irregular excavations in the lower part of the Ilium and upper part of pelvis.

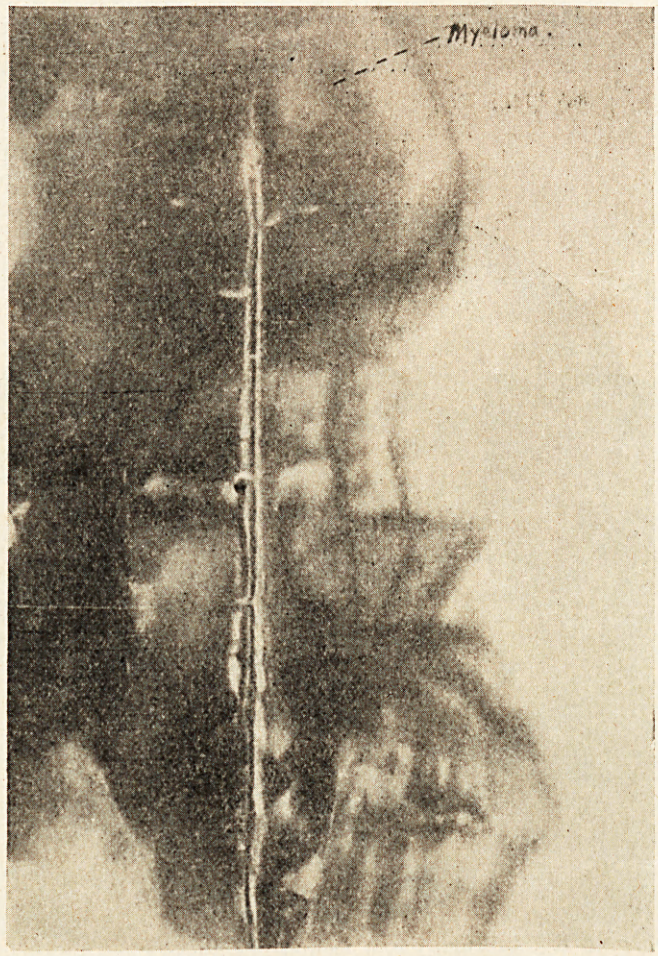

Fig. 5.—X-Ray of the skull showing punched excavation due to plasmacytoma.