EXTRAMEDULLARY PLASMOCYTOMA OF THE ORBIT* OBSERVATIONS ON TWO CASES

BY

JOHN F. COGAN

North Staffordshire Royal Infirmary, Stoke-on-Trent

EXTRAMEDULLARY PLASMOCYTOMATA have been described as arising from most organs and tissues, but in spite of this they are still comparatively rare. The first case to be reported was by Schridde (1905). They are most commonly found involving the upper air passages, but have occasionally been reported as arising from such sites as the stomach, ileum, lungs, lymph nodes, and thyroid gland. Various cases of plasmocytoma of the orbit have been described by François, Kluyskens, and Rabaey (1949), McEvoy (1949), and Jim (1955), and of the conjunctiva by Hellwig (1943), Wolff (1951), and Friedenwald and others (1952). However, a reasonable search throughout the literature of the last 20 years has resulted in the finding of only one description of a plasmocytoma of the lacrimal sac (Toselli, 1949).

These tumours are chiefly composed of plasma cells which have a characteristic cart-wheel distribution of chromatin. The nucleus is eccentric with a paranuclear halo. The connective tissue is scanty and delicate. There has been much difference of opinion as to where these plasma cells arise. Some suggest that they are derived from the lymphocyte; others, that their origin lies in the early myeloid reticulo-endothelial cells. Jaeger (1942) thought that extramedullary plasmocytoma arose from plasma cells in the lymphatic tissue.

An extramedullary plasmocytoma is localized and does not usually lead to metastases. In rare cases, however, metastases have been found in regional lymph glands and bone. Hellwig (1943) attempted to classify his series of cases into four types:

- (1) Non-cancerous single tumours;
- (2) Non-cancerous multiple tumours;
- (3) Cancerous tumours without metastases;
- (4) Cancerous tumours with metastases.

The benign tumours were firm, yellowish-grey in colour, and with a homogeneous cut surface. The malignant forms were soft, friable, and often necrotic. The histology of the latter showed greater variation in the size

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and form of the cells and nuclei with more mitotic figures than the localized plasma tumours.

Extramedullary plasmacytomata must be distinguished from plasma cell granulomata, which as well as containing plasma cells also contain the various cells of chronic inflammation. The stroma is more dense and the plasma cells tend to be grouped around capillaries. The lacrimal sac being commonly a site of chronic inflammation, it is possible that both types of pathology may exist together. The problem may also arise whether a tumour consisting of plasma cells is an extramedullary plasmacytoma or merely part of the general manifestations of multiple myeloma. It is with these points in view that the following cases have been reported.

Case Reports

Case 1, a 44-year-old man, attending the out-patients department in May, 1952, complaining of a swelling over the right eye for 3 months. Examination showed a soft non-pulsatile swelling just below the right supra-orbital margin. No definite limits to the tumour could be made out and it was not attached to skin. The globe was displaced downwards but the patient did not complain of diplopia (Fig. 1). The visual acuity of both eyes was 6/6, and the fundi normal. X-ray examination of the right orbit and sinuses showed no abnormality. The Wassermann reaction and Kahn test were negative, and the blood picture normal. Ear, nose, and throat examination revealed no involvement of the sinuses.

His general health was good.

Biopsy showed the swelling to be diffuse and of a greyish colour. No areas of necrosis or haemorrhage were noticed.

Pathological Report (A. J. McCall): "The tissue is highly cellular, most of the cells are uniformly round or oval and have a nucleus with a well-marked chromatin pattern. Many have the nuclear characteristics of plasma cells and there are small numbers of quite well differentiated plasma cells showing characteristic cytoplasmic basophilia. There are scattered reticulum cells. Reticulin is fine and scanty and is confined to the capillary walls. The appearances are compatible with a plasmacytoma."

Laboratory Investigations.—Sternal marrow normal. Urinary examination showed no evidence of Bence-Jones protein. Plasma proteins: Total 7.9 g. per cent., albumin 5.4 g. per cent., globulin 2.5 g. per cent. X-ray examination of skull, vertebrae, ribs, and pelvis normal.

The patient was referred for radiation therapy.

A periodical survey was undertaken, and over 4 years later, in August, 1956, the patient remained in good health. No evidence of the tumour could be found and no displacement of the globe was noticed (Fig. 2). The vision was 6/6 in both eyes, and the fundi normal. All investigations were negative.

FIG. 1.—Case 1, on admission. Note marked downward displacement of right globe.

FIG. 2.—Case 1, appearance 4 years later.

Case 2, a 64-year-old man, was first seen in February, 1955, complaining of pain around the left eye for several days. He also stated that he had noticed a swelling at the inner side of the left eye for 2 months and that the eye had a tendency to water. Examination showed that he was suffering from acute dacryocystitis. Visual acuity was 6/6 in the right eye and 6/18 in the left eye. His previous medical history revealed an abdominal operation in October, 1954, at another hospital; he was not quite sure of the purpose of this and as the two conditions did not seem related it was not followed up. After a course of systemic penicillin the acute stage settled down within a week, and he did not return to the out-patients department until a year later when he was found to have a large mucocoele of the left lacrimal sac discharging through a sinus below the internal canthus. He was advised to have the sac removed and a month later was admitted to hospital.

At operation in May, 1956, a grey swelling was found replacing the lacrimal sac and extending in the direction of the naso-lacrimal duct. The mass was soft and necrotic and broke up into several pieces. After removal no bony defect of the lacrimal fossa could be found and the bone did not appear to be eroded. The sinus was excised and the wound closed.

Pathological Report (A. J. McCall): "One piece of the tissue is highly cellular and is formed of closely-packed plasma and plasmacytoid cells. The stroma is scanty and the appearances are compatible with a plasmocytoma. The remaining tissue shows subacute and chronic inflammation."

As the growth at operation appeared to be extending into the nose, the patient was referred for ear, nose, and throat examination, where an ulcerating mass was found in the left nostril. X-ray examination of the sinuses was normal.

Laboratory Investigations.—The blood count was normal, no plasma cells were seen. The blood sedimentation rate was 19 mm. per hour (Wintrobe). Repeated tests for Bence-Jones protein were negative. The sternal bone marrow was normal. Electrophoresis of the serum showed an abnormal protein band in the γ -globulin region, but on fractionation by sodium sulphate precipitation the abnormal protein was precipitated with the β -globulin fraction. Total serum protein, 7.6 g. per cent., albumin 3.7 g. per cent., α -globulin 0.4 g. per cent., β -globulin including the abnormal protein 3.4 g. per cent., γ -globulin 0.1 g. per cent.

The Wassermann reaction and Kahn test were negative. X-ray examination of the skull, vertebrae, ribs, and pelvis showed no evidence of bony myelomatous involvement.

He was referred for radiation therapy.

In the meanwhile the case notes concerning the abdominal operation had been obtained, and it was found that he had attended the medical out-patients department in July, 1954, complaining of abdominal aching and flatulence associated with loss of weight and appetite. Examination had revealed an emaciated man with a mid-line mass palpable in the hypogastrium. Rectal examination was normal. He had a mitral systolic murmur, with blood pressure 170/110. Urine was normal.

He had been admitted for investigation, and the blood count was normal, blood sedimentation rate 28 mm. per hour (Wintrobe), fractional test meal showed some reduction in total acidity and free HCl, faeces no occult blood, Barium enema no evidence of obstruction, x-ray of chest showed the lungs to be rather emphysematous.

He had been referred to the surgical department where it was considered that the mass was arising from the colon, and at operation a large mass was removed from the transverse mesocolon.

Pathological Report (A. J. McCall): "Tumour measures $9 \times 5 \times 5$ cm. The centre of the mass is calcified. The periphery is composed of firm white gelatinous matter. It is formed of plasma cells. Mitoses are very infrequent. The appearances are indistinguishable from a plasmocytoma."

Laboratory Investigations.—Urinary examination revealed no evidence of Bence-Jones protein. Total plasma proteins 6.5 g. per cent., albumin 3.1 g. per cent., globulin 3.4 g. per cent.

He had been discharged in November, 1954, and examination a month later showed no evidence of recurrence. He had then failed to return for further observations.

Periodical survey is now, however, in progress. Abdominal examination 2 years after removal of the mass in the mesocolon shows no evidence of recurrence. There are also no signs of recurrence at the site of the lacrimal sac. The fundi are normal and the vision corrects to 6/6 in both eyes. Although repeated investigations remain negative except for the hyperglobulinaemia, the patient is still somewhat emaciated and has not gained in weight.

Discussion

The first case described illustrates the solitary type of benign plasmocytoma. Cases have been followed for 5 to 10 years without evidence of recurrence or metastases. However, Hellwig (1943) states that a plasmocytoma may remain benign for 10 years or more and that without change in its histology the process may then become generalized. Piney and Riach (1955) followed a patient for 12 years, who then developed metastases in the bones and died. It is not known, when dissemination occurs, whether this is due to true metastases or to a multicentric origin. If the tumour is localized and confined to soft tissues, cure may be obtained by surgical excision or irradiation. Dolin and Dewar (1956) gave a survival rate of 45.9 per cent. after surgical excision or radiation.

The second case belongs to the group of cancerous tumours with metastases. The microscopical findings differ little from those in Case 1, but most authorities are now agreed that the microscopical appearances cannot be depended upon in predicting the clinical outcome, the macroscopical appearances and localization being more important criteria. The fact that considerable necrosis was present and that the growth had spread into the nose places Case 2 in the malignant group; these appearances also rule out the possibility that the swelling was a granuloma of the lacrimal sac.

It seems likely that the primary arose in the transverse mesocolon, although the possibility that the growth in the lacrimal sac was of spontaneous origin cannot be definitely excluded, the patient having experienced lacrimal obstruction only one month after the removal of the abdominal growth. Intra-abdominal plasmocytomata have been reported on only few occasions (Vasiliu and Popa, 1928; Vallone, 1930; Brown and Liber, 1939; Esposito and Stout, 1945; Couret, 1946; Arel, 1946; Schwander, Estes, and Cooper, 1947; Gupta, 1953). In all these cases the gastro-intestinal tract was involved and obstruction was a marked feature. In cases where spread had occurred, it was the regional lymph glands that were affected, and no cases were reported where metastases had involved distant sites. The presence of the abnormal protein demonstrated by filter paper electrophoresis is evidence of residual deposits of growth. They may quite possibly be present in bone though not yet sufficiently widespread to be picked up by the marrow puncture needle. The outlook in this case is therefore poor, especially as

two separate tumours have been discovered. This case illustrates the value of the more refined chemical methods in giving a prognosis.

In order to exclude multiple myelomatosis, tests for Bence-Jones protein, total serum proteins, the albumin-globulin ratio, electrophoretic determination, sternal puncture, and x-ray survey of the skeleton must be carried out. In multiple myelomatosis, where the outlook is only about 2 to 3 years, the disturbance in the ratio of the plasma proteins is due to the specific secretory function of the plasma cells. However in extramedullary plasmocytoma an increase in globulin is sometimes detected. McEvoy (1949) described a plasmocytoma of the orbit in which the serum proteins were total 10.7 g. per cent., albumin 2.4 g. per cent., globulin 8.3 g. per cent. He thought this extreme hyperglobulinaemia to be suggestive of a diffuse myelomatous process. The Bence-Jones protein test distinguishes the protein present in the urine in cases of multiple myelomatosis from albumin; however, it is present in only 50 per cent. of cases. All such tests must be negative and the patient closely followed for a period of about 2 years before the tumour can be classified as an extramedullary plasmocytoma.

Summary

Two cases of extramedullary plasmocytoma of the orbit are described. The main distinguishing features between this condition, multiple myelomatosis, and chronic inflammation are reviewed. The value of electrophoretic determination is stressed. The tumour may be benign, locally malignant, or associated with metastases. When dissemination does occur it is not known whether these lesions are metastases or multifocal primaries. A guarded prognosis must be given.

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