A myeloma is an abnormal proliferation of plasma cells derived from reticulum cells (Innes and Newall, 1961). Four types are usually differentiated: multiple myeloma when tumours are scattered through the skeleton; solitary myeloma or plasmacytoma when the lesion is localized to a single focus in a bone; extramedullary plasmacytoma when the lesion is found in extraosseous sites such as the upper respiratory tract or gastrointestinal tract; and plasma cell leukaemia when myeloma cells are found in the blood. A case of extramedullary plasmacytoma originating in the stomach is now reported.

**CASE HISTORY**

A 46-year-old man developed tenderness and swelling of the right knee and right ankle, and during the next four weeks his shoulders and finger joints were similarly affected. Throughout this period the patient felt quite well although he lost a little weight. He was referred to the West London Hospital in June 1963. The ESR was 49 mm in one hour, the Rose Waaler test was negative, and radiographs of the hands and feet were normal. Salicylates were prescribed and in two weeks all joint symptoms and signs had subsided. The ESR, however, remained raised at 50 to 60 mm in one hour. The patient's weight was noted at 165 lb.

When next reviewed in January 1964 the patient complained of recent indigestion, loss of weight, and black motions. His haemoglobin was 8.2 g and his weight had fallen to 149 lb. A barium meal examination showed a large polypoid mass filling the stomach (Fig. 1) and this was considered to be a gastric carcinoma. The serum proteins were 5.4 g/100 ml (albumin 3.1, globulin 2.3 with slightly increased α1 and α2 globulins). Urine examination was negative for all forms of protein. A bone marrow examination was normal as were chest and skeletal radiographs.

Laparotomy was performed on 17 February 1964. A large intragastric tumour was attached to the lower part of the greater curve near the pyloric antrum. There were a number of enlarged lymph nodes in the omentum along the antral part of the greater curvature, the liver was normal, and no other intraabdominal abnormality was palpated. A high Polya type of partial gastrectomy was performed with excision of the greater omentum.

The tumour was cauliflower shaped (9 cm × 9 cm × 5 cm) with a narrow stalk attached in an area of roughened mucosa (3 cm × 4 cm). Histological examination of the main tumour showed dense sheets of tumour cells of plasma cell type, in places poorly differentiated (Fig. 2). Section of the stalk and the area of attachment showed a similar appearance. There was widespread tumour cell infiltration of the mucosa and submucosa and one of the lymph nodes removed from near the greater curvature. The conclusion was that the tumour was a malignant plasmacytoma of the stomach with secondary local lymph node involvement.

The patient's postoperative course was satisfactory and six months later he had no abnormal symptoms. The ESR, sternal bone marrow biopsy, and plasma proteins were normal. Thereafter he remained well until August 1965 when he developed a cough and stridor. Chest radiography showed a large mass lying in the posterior mediastinum displacing the trachea to the right.

**FIG. 1.** Barium meal showing a large polypoid mass in the stomach.
and a little forward (Figs. 3a and b). He was admitted to Hammersmith Hospital for further investigation. A barium meal showed that the oesophagus was deviated by a mass pushing it forwards from behind; the gastric remnant appeared normal apart from a filling defect high on the lesser curve. A radiographic skeletal survey was normal. Bronchoscopy revealed narrowing of the trachea, about two-thirds of the way down its length, to a crescentic slit which prevented further passage of the bronchoscope. During anaesthesia a small hard mass was felt in the epigastrium beneath the laparotomy wound.

At this time his haemoglobin was 14.3 g and the ESR was 20 mm in one hour. The bone marrow was normal and showed no evidence of multiple myeloma. The serum proteins were 7 g/100 ml (albumin 4.6 g, globulin 2.4 g). Electrophoresis demonstrated an M band and a trace of Bence-Jones protein in the serum. There was moderate Bence-Jones proteinuria (1 g daily). This was reported as a Bence-Jones plasmacytoma, type L, with no evidence of immune paresis. Melphelan was given but the patient developed increasing stridor necessitating deep x-ray therapy to the mediastinum. Within three days there was an improvement in the stridor and 10 days later it had disappeared. A chest radiograph showed that the mass was considerably smaller; a month later it was normal (Fig. 4). There was now marked reduction of the Bence-Jones protein in the urine (0.09 g daily).

In January 1966 he noticed a hard lump on the right clavicle and developed pain in the left buttock. Radio-

**FIG. 2.** Stomach tumour showing plasma cells.

**FIG. 3a.** Chest radiograph showing large mediastinal mass and small right pleural effusion.

**FIG. 3b.** Chest radiograph showing mass in mediastinum causing compression of the trachea.
graphs showed lytic areas in the right clavicle with a large soft tissue mass above it, and there were lytic areas in the left upper femur. There was a small firm nodule on the right anterior chest wall and drill biopsy of this showed a fragment of voluntary muscle widely separated by myeloma tissue, the appearances being those of much less well differentiated tumour than the original gastric lesion. At this time the haemoglobin was 10.9 g, white cell count 3,900/cu mm, ESR 68 mm in one hour. Total serum proteins were 6.2 g/100 ml (albumin 3.4 g, globulin 2.8 g). Urinary protein output was 2.9 g/day and this was largely Bence-Jones in type. A large, hard, irregular mass was palpable in the epigastrium. Deep x-ray therapy was given to the right clavicle, left femur, and epigastrium. The tumour masses were very radiosensitive and within a fortnight the clavicular and abdominal masses could no longer be felt.

In April 1966 he developed nausea, vomiting, abdominal swelling due to ascites, and pitting oedema of the right leg and thigh. There was now a huge, firm, rather nodular mass occupying most of the abdomen and extending well into the right flank. His haemoglobin was 10.2 g, white cell count 6,000/cu mm, and ESR 70 mm in one hour. Serum proteins were 5.8 g/100 ml (albumin 3.3 g, globulin 2.5 g) and there was again a prominent M band in the serum. There was increased output of Bence-Jones protein (5.4 g/daily). The blood urea was 40 mg/100 ml. A chest radiograph showed a small opacity in the right upper mediastinum. A skeletal radiographic survey was negative and a bone marrow biopsy showed no evidence of myelomatosis.

Six litres of fluid were removed from the abdomen and cytological examination showed large numbers of anaplastic cells, some of those more differentiated giving the staining reaction of plasma cells (Fig. 5). The patient was given further deep x-ray therapy to the abdomen and also blood transfusions as his haemoglobin had fallen to 8.1 g. Deep x-ray therapy proved ineffective, and a fortnight later a further 5 litres of abdominal fluid were removed to relieve discomfort. In the middle of May 1966 chest radiography showed a large mass in the mediastinum and a right pleural effusion. The serum proteins fell to 4.8 g/100 ml (albumin 2.3 g, globulin 2.5 g) and again a prominent M band (0.2 g) was found. Bence-Jones protein was found in the urine (3.3 g daily).

The patient died on 28 May 1966. Post-mortem examination showed that there were large tumour masses in the mediastinum adherent to the lung, sternum, and costal cartilages. The second and third right costal cartilages were destroyed by tumour deposits which had extended from the mediastinum externally to form a nodular mass under the skin. The lungs showed bronchopneumonia but no tumour deposits. A right hilar lymph node was replaced by tumour. There were numerous tumour deposits on both pleural surfaces. Eight hundred and fifty ml bloodstained fluid was found in the right pleural cavity. Deposits were found on both the pleural and peritoneal surfaces of the diaphragm. Straw-coloured fluid (1,800 ml) was found in the peritoneal cavity. In the stomach there was a small pedunculated tumour on the medial side of the anastomosis. Nodules of tumour were present on the mesenteric border of the small
intestine, along the mesentery of the large intestine, in the omentum and on the posterior abdominal wall. Near the splenic flexure there was a mass involving the pancreas and spleen, the pancreas being completely surrounded by tumour deposits. The liver and kidneys were normal. Deposits were found in the shaft of the left femur and in the occipital bone of the skull. Histological examination of the tumour deposits showed typical myeloma cells.

DISCUSSION

In both the solitary and extramedullary types of plasmacytoma there may be no abnormal laboratory findings. However, most solitary and extramedullary plasmacytomas ultimately develop signs of multiple myeloma while the extramedullary type may invade locally and metastasize to lymph nodes and bones. There is often extensive lymph node involvement in the extramedullary type whereas it is very rare in multiple myeloma (Dolin and Dewar, 1956). Extramedullary plasmacytoma is found most commonly in the upper respiratory tract and oral cavity but involvement of almost every organ has been reported. The gastrointestinal tract is the site of origin in about 10% of cases, the small intestine being more commonly involved than the stomach (Hampton and Gandy, 1957). The most common presenting symptoms are abdominal pain and gastrointestinal bleeding. Annamunthodo and Robertson (1959) reviewed the literature and reported the seventh case of solitary gastric plasmacytoma and since that time five further cases have been reported. This is the thirteenth to be described.

Bence-Jones protein is seldom detected in the serum but is found in the urine of about 50% of cases of multiple myeloma (Putnam, 1959). It is not pathognomonic of myeloma as it may be found in other reticuloses. The tumours are highly radiosensitive and after local irradiation the output of Bence-Jones protein diminishes. In our patient there was no hyperglobulinaemia but M globulin and Bence-Jones protein were found in the serum with large amounts of Bence-Jones protein in the urine.

The myeloma cells produce only one form of light chain, type K being found more frequently than type L. In our patient it was type L. There was no evidence of immune paresis.

At necropsy there was widespread glandular, pleural, and peritoneal involvement. Several tumour deposits were found in bones but the lungs showed no tumour deposits and in fact these are reported to be very uncommon even when wide dissemination has taken place (Robson and Knudsen, 1959).

SUMMARY

A case of gastric plasmacytoma treated by partial gastrectomy is described. Eighteen months later there was local recurrence and respiratory obstruction due to large mediastinal tumour deposits. There was now Bence-Jones proteinuria with M globulin and Bence-Jones protein in the serum. Radiotherapy resulted in the disappearance of the tumour deposits and lessening of the Bence-Jones proteinuria. Five months later there was a large abdominal mass and soft tissue swelling and lytic areas in bones. Again the tumours were highly radiosensitive and had disappeared within a fortnight. However, three months later there were further extensive metastases and radiotherapy was ineffective. The patient died 27 months after his partial gastrectomy.

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REFERENCES


