MEIGS SYNDROME WITH BLOOD-STAINED EFFUSION

BY

CHRISTOPHER S. DARKE AND C. J. DEWHURST

From the City General Hospital, Sheffield

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In 1937 Meigs and Cass described the case of a patient with ascites and hydrothorax in association with a benign ovarian tumour in which removal of the tumour relieved the patient of the ascites and chest fluid. Later that year Rhoads and Terrell (1937) published a further case and proposed the name Meigs syndrome for this clinical picture. In 1954 Meigs collected all reports in the English language together with a few from the French, Italian, and German literature and reviewed 84 cases which fell within his definition.

The importance of this syndrome lies in the fact that it can easily be cured by removal of the ovarian tumour, and this is now well recognized by surgeons and indeed by general and chest physicians. Nevertheless, blood-staining in the pleural and peritoneal effusions in such a case is a rare feature, and one which normally would be regarded as indicative of malignancy. The purpose of this paper is to record the cases of two patients with this syndrome with haemorrhagic fluid, one of whom was under close observation for over a year, and both of whom were ultimately cured by removal of the tumour.

HISTORICAL

A search of the literature has revealed that Spiegelberg (1866) first drew attention to this syndrome in a patient who died from a large fibroma and who had ascites and a left pleural effusion. Cullingworth (1879) reported the first clinical case of this syndrome, and Demons (1887) described nine patients with ovarian cysts who were cured of the ascites and hydrothorax by removal of the cyst. Lawson Tait (1892) reported a further case and advised that all patients with a pleural effusion and an abdominal tumour should have an abdominal exploration, even if the fluid was bloody. Demons (1900, 1902, 1903) mentioned three further cases of this syndrome cured by removal of the ovarian fibroma. For 34 years following Demons' discussion no mention of this condition was made in the literature, and it was not until the description by Meigs and Cass (1937) that interest was

revived. Since then the recognition that laparotomy is required in all cases of this syndrome, despite the clinical picture of malignant disease, has resulted in the saving of many lives.

DEFINITION AND SCOPE OF THE SYNDROME

Meigs (1954) has attempted a precise definition of his syndrome to avoid misconceptions, and has mentioned four characteristic features. (1) The tumour must be a fibroma or fibroma-like growth, a category which is held to include thecomas and granulosa-cell tumours. (2) The tumour must be accompanied by ascites. (3) There must be effusion in the pleura. (4) The removal of the benign tumour must relieve the patient of the ascites and pleural effusion.

Whilst there is no doubt that the fibroma group of tumours is the most common cause of fluid appearing in the serous cavities in this innocent manner, any abdominal or pelvic tumour may produce exactly similar findings. Moreover, although Meigs has sought to exclude any but benign lesions from his syndrome, he includes granulosa-cell tumours of which between a quarter and a third are malignant: as he himself points out it is certain that in other forms of ovarian malignancy effusions of fluid have occurred which were not due to extension of the malignant process. The precise diagnosis of the type of ovarian tumour present can seldom if ever be made pre-operatively, so that clinically the presence of an abdominal or pelvic tumour in association with ascites and fluid in the pleural cavity should indicate that the patient may easily be cured by removal of the tumour, whether subsequently histological examination of it satisfies Meigs' criteria or not.

The fluid in both serous cavities is usually clear and yellow, but may on occasions be blood-stained. Whilst the presence of such bloody fluid usually carries the stigma of inoperability this is by no means always so. In addition to the two cases reported here four others have been described in which the fluid in both serous cavities was blood-stained in the absence of any malignant process

(Vogt, 1940 ; Long, 1948 ; Spurney, 1948 ; Ridley, 1949). Vogt (1940) reported the case of a married woman of 44 years who complained of abdominal pain and swelling, cough, and dyspnoea. Blood-stained fluid was obtained from the abdomen and left pleural cavity, and a benign granulosa-cell tumour was removed, with disappearance of the sanguineous exudate. Spurney (1948) described an unmarried patient of 42 years who complained of an abdominal mass and dyspnoea. She had bilateral blood-stained pleural effusions as well as ascites. A right ovarian tumour was successfully removed. Ridley (1949) mentioned a married woman of 35 years who complained of abdominal and chest pain, anorexia, lassitude, loss of weight, night sweats, cough, and dyspnoea. She had blood-stained effusions in the right pleural and abdominal cavities which were completely relieved following removal of a right ovarian tumour. In Long's case heavily blood-stained fluid was obtained from the right pleural cavity of a woman aged 53, who had also an abdominal tumour. Operation was at first thought contraindicated, and a course of deep x-ray therapy was given to the pelvis. Later, the tumour which was arising from the left ovary was removed. This tumour also was thought to be a granulosa-cell tumour, although benign.

We consider it important to emphasize that such bloody fluid may be present in the absence of malignancy—much less inoperability—and that operation should not be deferred under these circumstances.

CASE REPORTS

CASE 1.—A housewife, aged 55 years, attended the Sheffield Chest Clinic on October 27, 1952, complaining of a recurrent cough and increasing dyspnoea since pneumonia in 1940. The clinical and radiological findings were those of a large left pleural effusion, and she was admitted to a sanatorium on the assumption that it was tuberculous. A number of aspirations were carried out, and on each occasion the fluid from the left pleural cavity was uniformly blood-stained. On microscopy, apart from the red cells there was a high proportion of lymphocytes and occasional polymorphonuclear cells. The fluid was sterile on routine culture, and guinea-pig inoculation and sputum examination were negative for tubercle bacilli. She received a short course of *p*-aminosalicylic acid and isoniazid, and, as her general condition improved, she was discharged home on January 28, 1953 ; throughout her stay in hospital she was afebrile. She reported to the clinic in March stating that she had bronchitis and increasing dyspnoea, and radiographs revealed a left pleural effusion filling the whole of the left hemithorax. Since there was no support for the diagnosis of tuberculosis, she was referred to a general hospital for further investigation. A more detailed inquiry revealed that

she had had pneumonia twice in childhood and attacks of winter bronchitis since 1940. There had been no haemoptysis nor indeed any constitutional symptoms other than slight loss of weight over a number of years. In July, 1941, she had been admitted to hospital as an abdominal emergency, and a large ovarian cyst was removed which had undergone torsion and ruptured on its posterior aspect.

Examination in March, 1953, showed a cheerful, well-covered woman in whom the only physical signs were those of a large left pleural effusion. She had very little sputum, but numerous examinations failed to demonstrate tubercle bacilli on direct smear, culture, or guinea-pig inoculation. Bronchoscopy revealed displacement of the mediastinum only. Many aspirations of heavily blood-stained fluid measuring between 2 and 4 pints (1,200 and 2,400 ml.) were carried out, but despite these the effusion rapidly reaccumulated. In all instances the fluid was sterile, containing a few chronic inflammatory cells and some collection of tissue cells which showed no malignant characteristics.

A pelvic examination was made, but no abnormality was found. Despite the good general condition it was felt that the rapid reaccumulation of a haemorrhagic effusion probably indicated malignant involvement of the pleura.

On one occasion air replacement of the effusion was carried out, but a subsequent radiograph revealed no obvious disease of the underlying lung, and the visceral and parietal pleurae were remarkably free from thickening.

On April 27, 1953, thoracoscopy was performed by Mr. J. T. Chesterman. The lung was freely mobile without evident disease, and the visceral and parietal membranes were smooth and normal. A large apical adhesion was seen, but not divided. In an attempt to gain pleural adhesions and to avoid repeated aspirations an indwelling intercostal catheter was inserted. This did not meet with success, and over the next two months a further six aspirations were made with similar results. During the patient's stay in hospital, amounting to four months, there was no fever, and she gained 1 stone in weight. She was discharged on August 5, 1953.

During the next few months she attended regularly as an out-patient, but said that she felt well and had no pain, although she was still breathless.

On November 11, 1953, she was readmitted owing to the development of a considerable ascites. Her general condition had now deteriorated with considerable loss of flesh, and fever was present for the first time, ranging from 98° to 100° F. Paracentesis abdominis was done, and a large quantity of blood-stained fluid was obtained. Further large aspirations of blood-stained fluid from the chest were carried out to relieve the respiratory distress. Examination of the abdomen after removal of the ascitic fluid revealed a lower abdominal tumour, thought to be ovarian in origin, a view which was later confirmed by examination under anaesthesia. Whilst the likelihood of the

tumour proving to be malignant—or indeed inoperable—seemed strong, laparotomy was nevertheless considered necessary.

At operation on December 2, 1953, a haemorrhagic left ovarian tumour was removed, about the size of a coconut. The omentum was adherent and on one side there was a large hole, possibly due to previous tapping. Apart from a fibrinous deposit over the peritoneum and a large quantity of free bloody fluid, there was no other abnormality. The bowel and uterus were normal. The right adnexae were absent. The post-operative course was normal, and within 10 days the large left pleural effusion had almost completely absorbed. The pathological report by Dr. A. J. N. Warrack was: "A large mass whose contents are mainly solid but appear to have invaded the capsule. On microscopy there are solid masses of anaplastic epithelial cells and in some areas there is papilliferous formation. The appearances are those of a granulosa-cell tumour."

After a period of convalescence the patient received a course of irradiation to the lower abdomen, as the tumour, which was histologically malignant, had apparently been injured before operation. The fluid in the chest and abdomen absorbed completely. Twenty months after the operation the patient was well and the chest radiograph was essentially normal.

CASE 2.—The patient, an unmarried nursing sister aged 45 years, was seen in November, 1953, after a routine radiograph of the chest had disclosed a right-sided pleural effusion. The only significant previous event had been a period of amenorrhoea from July to November, 1951, after which some heavy bleeding had occurred; periods continued afterwards every six to eight weeks lasting for eight to ten days. The patient had otherwise no complaints.

Examination showed her general condition to be very good indeed. There were physical signs of the pleural effusion, and on abdominal examination a soft regular tumour could be felt arising out of the pelvis, and ascites was present. Bimanual examination could not easily be carried out, and it was not possible to establish the nature of the pelvic tumour.

The pleural effusion was aspirated and a considerable quantity of blood-stained fluid was removed. Repeated sputum examinations failed to show tubercle bacilli, and a repeat radiograph of the chest after aspiration did not reveal any disease of the underlying lung. The haemoglobin was 85%, the white cell count 6,600 per c.mm., and the E.S.R. 27 mm. in one hour.

On December 13 the patient was examined under anaesthesia, and it was established that the uterus and pelvic mass were separate. A small cervical polyp was first removed, and curettage was carried out, thick, profuse endometrium being obtained. Laparotomy was then performed. The peritoneal cavity contained a large quantity of heavily blood-stained fluid, and the left ovary was replaced by a soft, highly vascular tumour; at one pole of the tumour was a raw area which was bleeding. The right ovary and tube and the uterus were normal. Total

hysterectomy and bilateral salpingo-oophorectomy were performed.

The pathological report on the removed tumour was as follows:

"There is a tumour of the left ovary the size and shape of a coconut. The capsule of the growth is eroded in a roughly circular manner 5 cm. in diameter. About three-quarters of the growth is solid and the remainder cystic. The solid part is coarsely trabeculated and slightly yellow. There is haemorrhage into the cysts and into some of the areas of the solid parts."

Histologically, the tumour was a granulosa-cell tumour showing a varying number of mitoses, and was apparently malignant.

The post-operative period was uneventful, and within a few days the remaining fluid in the pleural cavity had disappeared. Subsequent progress was good, and the fluid had not recurred one year later.

DISCUSSION

The particular interest of these patients lies in the fact that they presented as respiratory problems. A blood-stained pleural exudate due to a primary bronchial carcinoma or the result of pleural metastases from an extra-thoracic tumour is common, but there is usually clinical or other evidence pointing to the primary growth, as well as rapid deterioration in the general physical state. Although in Case 2 the ascites and pleural effusion were both evident when the patient was first examined, in Case 1 it is certain that no appreciable quantity of fluid was present in the abdomen until nearly a year had elapsed. It is indeed remarkable that such a large and continuous outpouring of blood-stained fluid was manifest in the pleural cavity of this patient for so long, in the absence of appreciable ascites. It is conceivable that the laxity of the abdominal wall could account for this, but the occurrence must be most unusual. Despite the clinical well-being of this patient, the conclusion was almost forced upon one that the process was malignant, a view which at first seemed confirmed when a blood-stained ascites was demonstrated.

It is interesting to speculate why and indeed how the bloody fluid occurred in the pleural cavity in these instances. In those cases in which there is pleural and peritoneal fluid, it has been established that the current of flow is from the abdomen to the chest. Injections of Indian ink into the peritoneal cavity have shown its presence in the mononuclear cells of the pleural fluid within a short space of time. The reverse has not been demonstrated (Meigs, Armstrong, and Hamilton, 1943; Lawson, 1950). Studies on the electrophoretic distribution of proteins in the two fluids have shown fairly conclusively that the two fluids are

the same (Meigs and Case, 1937). The exact communication between the two serous cavities is, however, still obscure, and thoracic surgeons have only rarely observed pleuro-peritoneal openings in the absence of herniation. Air introduced into the abdominal cavity in cases of ascites does not get into the chest with the patient erect as one would expect if the communication were a large one. On the other hand, occasional cases of artificial pneumoperitoneum have been complicated by a pneumothorax on one or other side, thereby demonstrating conclusively that openings do exist.

Paracentesis of the abdominal fluid does not usually relieve or prevent recurrence of the pleural fluid.

It has been suggested that the ascites in these cases of ovarian and other tumours may be due to leakage from the superficial tumour lymphatics. Pelvic lymphatics are frequently large, and it is possible that the ascitic fluid created by these growths may flow up these huge lymphatic channels, passing through the subdiaphragmatic lymphatics to the supradiaphragmatic lymphatics, and thence into the pleural cavity. Such a hypothesis is not proven.

The blood-staining of fluid already present might be accounted for by trauma to or torsion of the tumour. In this respect it is perhaps significant that the granulosa-cell tumour—of which there are four examples out of six cases with haemorrhagic effusions—is by far the most vascular of the fibroma group of tumours and therefore the one most likely to be injured by such accidents. As we have already seen, a proportion of these tumours are malignant, and might therefore begin to erode their capsule with resulting bleeding, as evidently happened in Case 2. The degree of malignancy of this type of growth, though variable, is on the whole less than that of other malignant tumours of the ovary, and such bleeding could therefore cause blood-staining of existing effusions

without indicating metastases. The subsequent rapid disappearance of fluid, and the continued well-being of both patients after operation, strongly supports the view that fluid appeared in these cases in the same way as in other cases of the Meigs syndrome, being independent of the histological malignancy of the removed tumours.

Study of both cases demonstrates again the need for operation when fluid is found in the pleural and peritoneal cavities in association with an abdominal or pelvic tumour, whether the effusions be clear or blood-stained.

SUMMARY

Two cases of the Meigs syndrome with blood-stained fluid in the pleural and peritoneal cavities are reported, both of which were cured by removal of the ovarian tumour.

The need for operation in all cases of abdominal or pelvic tumours associated with fluid in the chest and abdomen is stressed. This applies whether the fluid be clear or blood-stained.

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