Clinical Problems

Medical Presentations of Choriocarcinoma

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Summary

Choriocarcinoma commonly presents with symptoms resulting from metastases in the lungs, central nervous system, or alimentary tract. This tumour may occur without any gynaecological symptoms and when pelvic examination and uterine curettage show no abnormality. Several years may elapse between the antecedent pregnancy and presentation with metastatic disease. The ability to eradicate these tumours with present chemotherapeutic methods depends on detecting their presence as soon as possible after the antecedent pregnancy.

Wider recognition of the varied manifestations of metastatic choriocarcinoma and greater use of tests for chorionic gonadotrophin should result in earlier diagnosis and an improved prognosis in these patients. In particular, such tests should be made in patients with unexplained intracranial haemorrhage, progressive dyspnoea, and gastrointestinal haemorrhage.

Introduction

Uncommon diseases are no less varied in their modes of presentation than those encountered every day. Deviations from classical disease patterns inevitably tend to delay diagnosis, especially where the disease is uncommon; and when early recognition in the temporal sense is critical to therapeutic success delayed diagnosis must be held responsible for therapeutic failure. Such a situation exists at present with trophoblastic neoplasia.

Since effective chemotherapy was introduced by Hertz and his colleagues¹ the sustained remission rate, even in widely metastasized choriocarcinoma, has been high, provided treatment was initiated soon after the antecedent pregnancy. Treatment initiated a few months later, however, often fails to achieve complete elimination of the tumour.² The development of therapy for this form of carcinomatosis has therefore increased not diminished the need for early diagnosis.

Patients with choriocarcinoma usually seek gynaecological advice at an early stage of their disease, but sometimes medical features divert attention away from a consideration of trophoblastic neoplasia.

In this paper we analyse data from a group of patients who presented with symptoms resulting from metastases of gestational choriocarcinoma in locations other than the genital tract.

Patients and Method

Between 1958 and March 1970 179 patients with gestational trophoblastic tumours were treated at Charing Cross (Fulham) Hospital, and 49 of these who had non-gynaecological presentations form the subject of the present analysis.

A morphological diagnosis was not established in all of these patients at the time of presentation, but where tissue was available (26 of 49 patients) this was invariably consistent with or diagnostic of choriocarcinoma. In all instances there was clinical, radiological, and endocrinological evidence of trophoblastic neoplasia.

We have adhered to the classification of trophoblastic neoplasia adopted by the International Study Group.³

The main presenting symptoms in the 179 patients according to the system involved were gynaecological in 130, pulmonary in 36, C.N.S. in 10, and miscellaneous in 3.

Pulmonary Presentations

The main symptoms in the patients with pulmonary presentations were haemoptysis, dyspnoea, pleuritic pain, and cough without haemoptysis. One patient had been referred with symptoms suggesting thyrotoxicosis, but the presence of multiple discrete metastases on chest x-ray examination led to a diagnosis of trophoblastic neoplasia, confirmed by urinary chorionic gonadotrophin (H.C.G.) assay. All but one of the patients in this group had pulmonary radiological abnormalities on presentation, and these have been classified and related to the presenting symptoms (Table I).

TABLE I—Relation of Radiographic Findings to Presenting Symptoms*

X-ray Findings	No. of Patients	Haemoptysis	Dyspnoea	Pain	Cough
Discrete metastases	15	10	4	3	4
Metastases with effusion or collapse . .	7	3	2	5	—
Pulmonary hypertension and discrete metastases . .	6	5	5	1	—
Pulmonary hypertension alone . .	3	2	2	2	—
Snowstorm pattern	3	—	2	1	1
Total	34	20	15	12	5

*Many patients had multiple symptoms at presentation. One patient not included had radiological appearances of pulmonary oedema associated with haemoptysis, dyspnoea, and pleuritic pain.

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These data compare with radiological abnormalities seen in 55 (42%) of 130 patients presenting with gynaecological symptoms. Of these patients 6 (5%) had cardiorespiratory symptoms when diagnosed.

Choriocarcinoma in the 36 patients in this group had occurred after hydatidiform mole (15), abortion (10), and full-term pregnancy (11). The interval between antecedent pregnancy and presentation ranged between 1 and 60 months, and its relation to prognosis is shown in Table II. A history of irregular menstruation was given by 24 patients, and hysterectomy had been performed in seven before the diagnosis was made.

The following case is an example of presentation with pulmonary metastatic disease.

TABLE II—Interval between Antecedent Pregnancy and Pulmonary Presentation Related to Prognosis

	Patients Presenting within 6 Months	Over 6 Months
In remission	10	9
Dead*	5	11
Total	15	20

Remissions ranged from 6 months to 13 years.

*The interval after antecedent pregnancy was unknown in one fatal case.

CASE 265

In May 1964 a 23-year-old woman had a hydatidiform mole evacuated, and irregular vaginal bleeding persisted for 18 months afterwards. Between 1966 and 1968 she had several episodes of amenorrhoea lasting up to five months, each followed by brisk vaginal haemorrhage. In the presence of repeatedly positive urinary pregnancy tests these episodes were thought to be recurrent abortions. After a further three months of amenorrhoea in 1968 vaginal bleeding occurred and she was given a progesterone implant. As the uterus failed to enlarge a diagnosis was made of missed abortion. Further bleeding occurred in early 1969 and a dry cough started in February of that year, followed by backache and a left chest pain. Chest x-ray examination in April showed normal lung fields, but another examination in June showed rounded shadows in both lungs. A tentative diagnosis of pulmonary tuberculosis was made and treatment was started with a combined para-aminosalicylic acid and isoniazid regimen.

Pelvic examination at that time was normal, and this was considered to exclude a diagnosis of trophoblastic neoplasia. The patient became progressively more dyspnoeic but the symptoms were thought to be partly functional in origin. By July, however, the radiological appearances had deteriorated and a poor peak expiratory flow of 135 litres/minute was found. She was then referred to another hospital for lung biopsy, where pregnancy tests on the urine were found to be strongly positive and the correct diagnosis was made.

On admission to Fulham Hospital she was apprehensive and severely dyspnoeic, with clinical and electrocardiographic evidence of gross pulmonary hypertension. The haemoglobin concentration was 9.5 g/100 ml, arterial PO_2 46 mm Hg, and the urinary H.C.G. excretion 150,000 IU/day. Chest radiography showed gross enlargement of the pulmonary arteries and numerous semiconfluent opacities.

Despite immediate therapy with oxygen, diuretics, and specific chemotherapeutic agents she deteriorated rapidly, dying four days after admission. At necropsy a mass of necrotic tumour and fibrin adherent to the wall of the right atrium was found, and there was almost complete occlusion of all the main lobar and segmental pulmonary arteries by tumour. Extensive parenchymatous metastases were seen in both lungs. There was no evidence of tumour in the uterus or elsewhere.

Neurological Presentations

Ten patients presented with neurological symptoms. Eight had evidence of raised intracranial pressure, frequently with papilloedema and disturbances of consciousness. In all eight

involvement of the pyramidal tracts had produced hemiparesis, and in two the spinal fluid was blood-stained. One patient presented with classical features of a subarachnoid haemorrhage and another, with unilateral blindness from a trophoblastic embolus of the central retinal artery, with proliferation into the retina itself. One patient not included in this group developed a paraparesis a few weeks after evacuation of a molar pregnancy. She was treated with deep x-ray therapy to the spine, though no diagnosis was made at the time. Symptoms remained static until five years later, when she presented with a pulmonary metastasis. In retrospect the earlier episode was probably related to a spinal trophoblastic metastasis and should have led to a much earlier diagnosis.

In the 10 patients choriocarcinoma had occurred after hydatidiform mole (3), non-molar abortion (3), and full-term pregnancy (4), and the latent interval had varied between 1 and 66 months. The relation between the latter and the prognosis is shown in Table III.

TABLE III—Prognosis Related to Length of History and Antecedent Pregnancy in Patients with Neurological Presentations

Case No.	Antecedent Pregnancy	Interval from A.P. to Presentation in Months	Outcome and Duration of Follow-up
254	F.T.N.D.	1	Well (1 year)
258	F.T.N.D.	2	Well (1 year)
7	F.T.N.D.	6	Well (11 years)
61	Ectopic gestation	6	Well (6 years)
133	Abortion	19	Well (3 years)
49	H.M.	10	Dead
236	Abortion	10	Dead
85	H.M.	14	Dead
257	F.T.N.D.	48	Dead
11	H.M.	66	Dead

A.P. = Antecedent pregnancy. F.T.N.D. = Full-term normal delivery.

H.M. = Hydatidiform mole.

Seven patients had a history of irregular menstruation for which no cause had been found, while two other patients had previously undergone hysterectomy. At the time of presentation 8 out of the 10 patients had evidence of widespread metastatic disease with abnormal chest x-ray pictures and 4 had pulmonary symptoms.

The following case illustrates some of the diagnostic problems which may be encountered in neurological presentations.

CASE 133

In June 1962 a 26-year-old woman had an abortion. Subsequent uterine curettages were normal, but in late 1963 she had an episode of amenorrhoea thought to have been a missed abortion.

In November 1965 she collapsed and was found to have a right hemiparesis, a left hemianopia, and a blood pressure of 190/110. Radiological studies showed left middle cerebral artery occlusion, a deformity of the right kidney suggestive of an infarct, and an opacity in the right pulmonary lower zone thought initially to be a "vascular anomaly." After extensive investigations she was treated with methyldopa for her persistent hypertension. In March 1966 a left axillary artery embolus occurred, followed one month later by a brisk melaena which required massive blood transfusion. Barium meal and follow through examination showed a jejunal abnormality which was considered to be compatible with a diagnosis of mesenteric artery occlusion.

In view of doubt about the nature of the pulmonary lesion a thoracotomy was performed, which showed vascular adhesions between the lung and diaphragm. A right lower lobectomy was performed. Histological examination showed choriocarcinoma in the pulmonary vessels, with extravascular extension and localized pulmonary infarction. Urinary H.C.G. levels were raised (300,000 IU/litre) and the patient was referred to Fulham Hospital for therapy.

At this time she had a residual right hemiparesis and a nominal aphasia. The persisting melaena stopped after six weeks' treatment with cytotoxic chemotherapy. In addition the hemiparesis improved and urinary gonadotrophin titres fell to the normal luteinizing hormone range. Chemotherapy was continued and she left hospital after five months of treatment.

Two months later urinary H.C.G. titres started to rise again above the normal range and chemotherapy was immediately re-instituted. An initial good response was not maintained and hysterectomy was therefore performed, but there was no histological evidence of uterine trophoblastic disease. Treatment with 6-azauridine and a series of skin grafts from the patient's husband were followed by a return to normal of urinary gonadotrophin excretion. She remained well for three years, the only residual neurological defect being mild dysphasia.

Miscellaneous Presentations

Of the three patients in this group two presented with melaena from metastases within the bowel and the third with severe left-sided abdominal pain, haematuria, frequency, dysuria, and a large left-sided renal mass. In all three clinical examination and radiography showed evidence of widespread metastatic disease with a gross rise of the urinary gonadotrophin titres.

One of the cases presenting with melaena occurred after hydatidiform mole and the other after a non-molar abortion. The intervals before presentation lasted 5 and 24 months respectively and were free from menstrual irregularity. In the third and only surviving case 28 months elapsed between evacuation of a hydatidiform mole and presentation, but the patient had a normal pregnancy and an episode of irregular menstrual bleeding during this time.

Case 240 (see below) illustrates the problems which may arise with follow-up of post-molar cases. The radiological opacities in the chest were considered to be benign trophoblastic emboli, and though pregnancy tests were positive their significance was not realized. Only when the patient presented with severe melaena was the diagnosis of trophoblastic neoplasia established.

CASE 240

In March 1968, after three months of amenorrhoea, a 23-year-old woman was admitted to hospital with a threatened abortion which was treated conservatively. One month later a rounded shadow was seen radiographically in the left lung. In early July she passed some molar vesicles vaginally, and on the 17th of that month a hydatidiform mole was evacuated. Subsequent monthly pregnancy tests remained positive, and chest x-ray examination showed further opacities in both lungs.

In view of pronounced deterioration, with increasing pallor, dyspnoea, and anorexia, she was admitted to hospital on 5 December and found to be profoundly anaemic as a result of melaena. She required 2 pints (1,140 ml) of blood per day to maintain a haemoglobin of 7 g/100 ml. The urinary gonadotrophin excretion exceeded 1,000,000 IU of H.C.G./24 hours.

She was transferred to Fulham Hospital on 21 December and began a short course of specific therapy. Intestinal bleeding increased, up to 5 pints (2,840 ml) of blood per day being given to maintain a satisfactory blood pressure. In view of this and her uncommon blood group (AB positive) laparotomy was performed on 1 January 1969 and a cluster of metastases in the proximal ileum was found. This segment of bowel was resected but bleeding persisted, and another laparotomy showed duodenal metastases around the ampulla of Vater which could not be removed. Bleeding was arrested by the insertion of duodenal sutures, and a gastroenterostomy was performed.

After temporary improvement with the H.C.G. excretion falling to 900 IU/day she suddenly collapsed. She was resuscitated but developed a biliary fistula with biliary peritonitis and deteriorated rapidly, dying on 20 January. Necropsy showed multiple pulmonary and hepatic metastases and leakage of intestinal contents across the small-bowel anastomosis.

Discussion

Most of the features of trophoblastic neoplasia are explicable on the basis of three major characteristics of trophoblastic tissue. These are its tendency to invade blood vessels, which leads to early dissemination, its rapid rate of proliferation, and its vascularity. A trophoblastic embolus may produce a variety of clinical syndromes depending not only on the site of impaction but also on the extent of secondary intravascular thrombosis, the degree of proliferation into and compression of surrounding tissue, and the extent of local haemorrhage.

The commonest form of metastatic choriocarcinoma is the discrete tumour mass, but vascular obstruction may occur alone, while often both forms of secondary spread are present in the same patient.

DISCRETE METASTASES

Discrete metastases were radiologically apparent in 80% of the pulmonary and all of the miscellaneous presentations. Demonstration of such metastases in the brain, however, is more difficult and gamma scans often failed to show them in our patients. Intracranial involvement was confirmed in this series by comparison of spinal fluid and plasma H.C.G. levels.⁴

Intracranial metastases occurred in the absence of overt pulmonary metastases twice in this series. In addition to the possibility of seeding from radiologically occult pulmonary metastases there are two possible routes by which trophoblast may reach the brain in such patients. With repeated pulmonary embolization arteriovenous shunts may open up in the lungs⁵ or, alternatively, some cells may travel via the vertebrobasilar system of veins.^{6,7}

Metastases may show themselves by bleeding, and this may be overt in the case of alimentary, renal and pulmonary involvement. In eight patients included in the group with gynaecological presentations intraperitoneal haemorrhage occurred, a presenting feature described by Hammond *et al.*⁸ In three of the patients in this series haemorrhage resulted from metastases on the visceral layer of the peritoneum and in five from the primary tumour perforating the uterus. Subarachnoid haemorrhage deserves special mention, if only because malignant trophoblastic neoplasia is rarely considered as a cause. It occurred as the presenting feature in Case 258 in our series and in a case described by Seal and Millard,⁹ while blood-stained spinal fluid was found at or shortly after presentation in five other patients in our series. Subdural haemorrhage was reported by Acosta-Sison.¹⁰

Clinical features produced by compression of surrounding structures may be variable. Slowly growing intracranial tumours may give rise to headaches, deterioration of memory and intellect, disturbances of consciousness, and clinical signs of raised intracranial pressure. Because of the haemorrhagic nature of the tumour, however, this type of presentation is less common than the rapid onset of neurological signs related to bleeding into necrotic tumour and compression of surrounding tissue. Jacksonian epilepsy from this cause and status epilepticus may occur,¹¹ but by far the commonest manifestation is a hemiplegic syndrome.^{12,13} Paraplegia from spinal cord involvement has been described as a presenting feature¹³ and occurred in one patient in this series shortly after the diagnosis had been made.

In the lungs distortion of the bronchial tree by metastases may produce chronic non-productive cough. Compression of the urethra by a vaginal metastasis, as reported by Bagshawe,¹⁴ was a presenting feature in two patients in the gynaecological group of this series.

Metastases in abdominal viscera may result in distortion of the abdominal contour, while superficial metastases in rare sites, such as the gum,¹⁵ maxilla,¹⁶ breast,¹⁷ or skin, may be visible and show the characteristic placental discoloration.

Vascular obstruction by trophoblastic emboli produces disturbances comparable to occlusion of vessels by thrombotic processes, but is usually accompanied by extension of the

tumour into the surrounding parenchyma. Infarction distal to the obstruction is common and may result in pleuritic pain, pleural effusion, haemoptysis, and haematuria. Patchy radiological opacities in the chest from this cause may be misleading, especially when there are no gynaecological abnormalities or discrete pulmonary metastases.

One form of obstructive vascular disease of particular importance is that involving the pulmonary arteries, producing progressive pulmonary hypertension with its accompanying dyspnoea and sometimes chronic cough. McMichael¹⁸ first mentioned this as a mode of presentation of choriocarcinoma, Bagshawe and Brooks¹⁹ described three further cases, and Spiegel²⁰ reviewed the literature in this context. Efans *et al.*²¹ pointed out that at times there may be no radiological abnormality in these patients, and it is clear that choriocarcinoma should be suspected in unexplained cases of progressive pulmonary hypertension in young women.

In the brain cerebral infarction may produce hemiplegia, while sometimes typical "cerebral artery syndromes"—for example, Case 133—and exceptionally retinal artery embolism (Case 11) occur.

ABSENCE OF GYNAECOLOGICAL FEATURES

One feature of both theoretical and practical importance in the consideration of patients presenting medically with metastatic choriocarcinoma is the presence or absence of gynaecological features. Whereas those patients with little or no uterine tumour can present only when symptoms arise as a direct consequence of metastases it is probable that many of the patients who eventually presented medically could have been diagnosed earlier if abnormal menstrual bleeding had been investigated with a urinary gonadotrophin assay.

Patients with trophoblastic neoplasia occurring after a molar pregnancy, where the risk of choriocarcinoma is known to be high, ought to be diagnosed particularly early, since follow-up is a practical proposition. Such patients in our series, however, were poorly followed up, with an average of one pregnancy test every 5.8 patient-months. In addition disturbances of menstruation had not been afforded due significance, for the average interval between antecedent pregnancy and presentation was longer where such abnormalities had been present than where they had been absent (25.4 months as opposed to 15.1 months). The interval between antecedent pregnancy and presentation in the patients presenting medically, and its relation to the type of antecedent pregnancy and to prognosis is shown in Table IV. The post-molar cases with delayed diagnosis have a much worse prognosis than patients with other types of antecedent pregnancy; however, trophoblastic neoplasia occurring after hydatidiform mole does not necessarily carry a poor prognosis, for of 91 post-molar cases presenting with gynaecological symptoms only 8 died, the rest achieving full remission.

TABLE IV—Average Interval between Antecedent Pregnancy and Presentation related to Prognosis.

Type of Antecedent Pregnancy	Interval between Antecedent Pregnancy and Presentation (months)				Prognosis	
	Pulmonary	C.N.S.	Miscellaneous	Combined	Dead	Full Remission
Molar	19.0	30.0	14.5	21.1	14	6
Abortion	4.3	12.0	24.0	13.4	4	8
F.T.N.D.	11.9	14.0	—	12.9	5	11

F.T.N.D. = Full-term normal delivery.

Early diagnosis and prompt treatment of choriocarcinoma is associated with a good prognosis,²²⁻²³ and the interval between the antecedent pregnancy and the start of chemotherapy seems to be of greater significance in this respect than the extent of metastatic spread. Thus 14 out of 20 patients presenting medically within six months of the antecedent pregnancy achieved

complete remission, while in 28 patients where the interval was over six months 11 achieved full remission. In one patient who died during therapy the interval could not be determined.

Where gynaecological features are absent, and especially where hysterectomy has been performed (as in 9 of our 49 cases) or where uterine curettages are normal, a high level of suspicion is of paramount importance if an early diagnosis is to be made. There is no doubt that widely metastasized choriocarcinoma may be associated with a histologically normal uterus,²⁴⁻²⁶ as in five of our cases. The reason for this can rarely be determined in individual cases. Regression of the uterine tumour or a non-gestational origin for the tumour are possibilities which must be considered. Also dissemination of trophoblast is known to occur in normal pregnancy²⁷⁻³⁰ and in molar pregnancies.³¹⁻³³ It is possible that malignant change takes place only in the deported trophoblast, so that after extrusion or evacuation of its contained placenta or benign mole the uterus remains normal. Alternatively such a situation may arise where a small choriocarcinoma which has already metastasized is completely expelled at delivery or abortion within an otherwise normal placenta.³⁴⁻³⁵

The absence of a uterine tumour is often associated with the development of choriocarcinoma several years after the last known pregnancy. Dyke and Fink³⁶ reviewed the problems of latent choriocarcinoma and limited their discussion to cases where hysterectomy had been performed for mole, thus obviating the difficult question of recent undetected abortion. The mechanisms responsible for these long latent periods are unknown. The diagnostic problems which may arise in these situations are illustrated by the patient who died from surgically demonstrated choriocarcinoma of the brain four years after hysterectomy for mole³⁷ and by one who presented six years after hysterectomy for mole with a large liver metastasis masquerading as cholecystitis.³⁸

To detect choriocarcinoma presenting medically as early as possible and thus to allow effective therapy, we recommend that sensitive urinary gonadotrophin assays should be performed in young women presenting with a variety of medical problems where the cause is not evident, and especially where there is a history of pregnancy or menstrual irregularity. From the evidence of this series and the relevant medical literature such an investigation would be particularly pertinent in patients with subarachnoid haemorrhage, acute hemiparesis or paraplegia, clinical evidence of cerebral tumour or raised intracranial pressure, persistent cough with or without haemoptysis and chest x-ray changes, progressive pulmonary hypertension, melaena, haematuria, or abnormal masses in abdominal viscera.

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Contemporary Themes

Some Administrative Problems in Adaptation of Houses for Home Dialysis

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Summary

A study of the rate of adaptation, cost, and method of payment for converting the house for home dialysis in 35 patients from Fulham Hospital has shown considerable differences among local authorities in assessing and demanding contributions from patients in various areas. It is shown that delay in adapting houses has resulted in the dialysis unit being unable to take on at least 19 new patients during the years 1967-70. A more uniform approach, together with some central financial arrangements, might avoid undue hardship and delay.

Introduction

Owing to the saturation of hospital haemodialysis spaces the only method of treatment available to many patients with chronic renal failure is either home dialysis or renal transplantation. The number of kidneys from all sources available for transplantation does not meet the demand, and the graft survival rate is, at best, 70% at two years. Moreover, as some patients are not suitable for transplantation home dialysis is becoming the mainstay of treatment for the control of terminal renal failure. Excellent results from home dialysis have been

achieved¹ and most patients prefer home dialysis to hospital dialysis. We have experienced certain administrative difficulties, however, which have retarded the rate at which patients have been able to go on home dialysis. This has severely limited the number of patients that we have been able to take on to the programme. The following account discusses the methods of sending patients out to home dialysis from Fulham Hospital and analyses some of the difficulties encountered.

Method

The ideal method employed for adapting a house for home dialysis is as follows. As soon as the patient is taken on for dialysis the home dialysis administrator visits the patient's home to assess its suitability for conversion. If suitable, a site meeting is called, when representatives of the local authority (usually consisting of a doctor from the health department, an administrator, a surveyor, an architect, and a representative from the local water board) meet the home dialysis administrator, the hospital social worker, and the home dialysis technician. At the site meeting a rough plan is drawn up based on the hospital specifications. Later, a more detailed plan is made and submitted to a local builder for costing. The final costed scheme is placed before the council for financial approval. Work is begun shortly after, and the whole scheme from the initial contract to the completed house should not take longer than three months.

Results

From July 1967 to December 1970 35 patients had home dialysis

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