MEDICAL MEMORANDA

Pyogaseous Infection in Pregnancy

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British Medical Journal, 1971, 3, 620-623

Advances in therapy have made gas gangrene in pregnancy rare. We report here one case in intrauterine pregnancy and four cases of gas gangrene of the fetus in extrauterine pregnancy. Gas gangrene in extrauterine pregnancy is extremely rare.

Case 1

The patient, a 24-year-old nullipara, had an uneventful pregnancy until near term, when fetal movements ceased and intrauterine death was diagnosed. Two weeks later a forewater amniotomy was performed to induce labour. Two days later she developed pyrexia and was treated with penicillin and streptomycin. The next day, since labour had not yet started, an intravenous infusion of Syntocinon (synthetic oxytocin) was begun. The pyrexia increased and severe oliguria developed. On admission to the University College Hospital, Ibadan, she was very ill with toxæmia and shock. There was a fine crepitus all over the uterus. No free fluid was detected on abdominal examination. There was a foul-smelling, frothy vaginal discharge but no vaginal bleeding. The cervix admitted only the tip of one finger.

FIG. 1—Lateral radiograph showing single fetus with cephalic presentation. Positive Spalding's sign. Uterine cavity outlined by copious amount of gas. Gas has replaced fetal soft tissues.

A lateral radiograph of the abdomen (Fig. 1) showed a mature fetus with cephalic presentation. Spalding's sign was present. The uterus was outlined internally by gas, and the fetus contained nothing but bones and gas. The appearances were those of gas gangrene complicating intrauterine death. A high vaginal swab yielded coliforms on culture. Repeated blood cultures were sterile.

Antitetanus serum (1,500 units) and anti-gas-gangrene serum (25,000 units) were given intramuscularly on admission, and penicillin 2 megaunits and chloramphenicol 1 g four-hourly intravenously. As the patient had failed to progress in labour after 48 hours a laparotomy was performed. There was severe plastic peritonitis. The uterus was tumid and appeared greyish black and relatively avascular. After a macerated fetus had been delivered the uterus "collapsed." A hysterectomy was then performed.

Intravenous fluids and antibiotics were continued, together with hydrocortisone intravenously, 500 mg twice daily. The patient's condition deteriorated and she died on the third postoperative day.

Case 2

The patient, a 35-year-old gravida-3, had an uneventful pregnancy until term, when she developed what was believed to be hydramnios. Fetal movements ceased and x-ray examination showed signs of fetal death. Four weeks later labour had not started and an attempt to induce labour with intravenous Pitocin (oxytocin) failed. A laparotomy was attempted but was abandoned because of lack of compatible blood. On admission to the University College Hospital a fortnight later she was anaemic and jaundiced. She had an unhealed right paramedian wound. The abdomen had a tender, central mass which appeared to arise from the pelvis and extended to the epigastrium. There were no palpable fetal parts. On pelvic examination the cervix was high and closed and the abdominal mass was inseparable from the uterus, which corresponded in size to a 12-week pregnancy.

Lateral x-ray examination of the abdomen (Fig. 2) showed a single fetus high in the abdomen, anteriorly placed, and with no visible uterine shadow round it. The fetus contained nothing but gas and there were no soft tissue shadows. The appearances were consistent with those of gas gangrene in an extrauterine pregnancy. Arteriography (see Fig. 3) showed small uterine vessels, as seen in a non-pregnant state, and no definite vascular supply to the fetus was seen. The right ovarian artery was dilated and ramified and was possibly supplying the placenta.

FIG. 2—Lateral abdomen. No uterine wall shadow seen. Fetus is rolled up hyperflexed, high, and anterior, with gas in its skull, chest, and abdomen. Spalding's sign positive.

A high vaginal swab yielded no organisms on culture. Six consecutive blood cultures were sterile.

The patient was given parenteral penicillin and streptomycin and antitetanus and anti-gas-gangrene sera, and she was slowly transfused with packed cells. At subsequent laparotomy there was a large extrauterine pregnancy in the right broad ligament extending up to the stomach and adherent to it and to the transverse colon. A macerated female fetus weighing 2,700 g was delivered, with the

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FIG. 3—Arteriogram from Case 3 (anteroposterior view) showing small uterine arteries (arrowed).

escape of about 2 litres of infected liquor amnii and a volume of gas. A subtotal hysterectomy and excision of the sac was performed. The patient was maintained on intravenous fluids and antibiotics and she made a good recovery. She was discharged from hospital after six weeks, and six weeks later she was well.

Cases 3, 4, and 5

These three cases were identical in presentation and were all extrauterine pregnancies complicated by a pyogaseous infection. The pregnancies were all postmature, with subsequent fetal death and failed induction of labour. The radiological findings (Fig. 3) confirmed pyogaseous infections similar to that in Case 2.

Comment

In early cases of gas gangrene or pyogaseous infection of the uterus the features are those of septicaemia, which may lead to circulatory failure and death, as in Case 1. Extension of gas gangrene from the uterus to the peritoneum leads to peritonitis. Other complications are emphysematous vaginitis, thrombophlebitis, lymphangitis, and renal failure (Adams and Adams, 1931; Holly *et al.*, 1960). The principles of treatment are early diagnosis, prompt prophylaxis, early elimination of the focus of infection, massive antisera administration, and systemic antibiotic therapy.

The prognosis depends mainly on the extent and duration of the infection, early diagnosis and treatment, and the degree of kidney damage. Hill (1936) reported a mortality of 63% in 30 cases of postabortal and puerperal gas gangrene.

Russel and Roach (1939) were the first to report the use of x-ray examination in the diagnosis of gas gangrene of the uterus. The presence of air and fluid in large amounts, as in the present cases, indicates sepsis by gas-forming organisms, since the gas is more than would be seen in cases of uncomplicated fetal death. Radiography is the diagnostic method of choice. It is quick and reliable, and thus ensures early and prompt surgical intervention to eliminate the focus of infection. Bacteriological examination of vaginal discharge or of a vaginal swab and blood cultures, though useful, may prove negative. Moreover, the results are usually delayed.

We are grateful to Professors J. P. Hendrickse and O. A. Ojo for permission to report these cases, and to Professor S. P. Bohrer for the use of the radiological museum and for his helpful criticisms.

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Aluminium Hydroxide Granuloma

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British Medical Journal, 1971, 3, 621-623

It is well known that subcutaneous injection of triple vaccine may cause a granuloma, but it is usual for such nodules to subside without treatment after some months. In each of the two cases reported below a postimmunization granuloma was excised before its aetiology was recognized. The histological findings are of interest.

Case 1

On 25 July 1969 a 10-year-old boy presented with a swelling over his right triceps which had been gradually decreasing, but he complained of pain over the nodule and over the scapula. He had had

an injection of purified toxoid aluminium hydroxide vaccine on 29 April 1969 and another on 12 June. On examination a firm tender subcutaneous nodule was present over the midpoint of the right triceps. It was not attached to the skin or bone nor inflamed. On excision it was solid, brownish in colour, measured 17 by 11 by 6 mm and appeared to be encapsulated. The cut surface showed a cicatricial centre containing yellowish creamy material (Fig. 1).

FIG. 1—Naked-eye appearance of a section of the granuloma in Case 1. (H. and E. $\times 4$.)

Haematoxylin and eosin staining showed a centre of eosinophil granular necrotic tissue heavily invaded by polymorph granulocytes. Around the necrotic centre was a narrow zone of epithelioid histiocytes arranged in a loose palisade manner. Many had coalesced to form multinucleated giant cells. Peripherally the histiocytes were

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