solone 20 mg by mouth daily on days 1 to 14 of a 42-day cycle (MEFUP). Treatment was continued until disease progressed or until a total dose of 550 mg/m² doxorubicin had been given unless side effects necessitated stopping sooner.

The response of metastatic breast cancer was assessable in 68 patients. Forty-two patients received VDP and 40 received MEFUP. Fourteen patients had both combinations at some time and all patients had at least two courses of the appropriate chemotherapy.

Initial assessment included physical examination, blood count and biochemistry, chest x-ray examination, radiological skeletal survey, bone scan, liver scan, and liver ultrasound. Relevant investigations were repeated at appropriate intervals during and at the end of treatment. Complete remission was defined as no clinical or investigative evidence of tumour in the appropriate site for over two months. Partial remission was defined as decrease by more than half of the estimated volume of all palpable or radiological lesions for over two months, or for bone a decrease in the number of hot spots on the bone scan or radiological sclerosis of lytic metastases, or both.

Disease was assessable in a total of 102 sites (see table). With both combinations soft tissue disease responded better than visceral disease and the response of bony metastases was poor. Median duration of response (CR and PR) was 8 months for MEFUP and 8.5 months for VDP.

Response of metastases to VDP and MEFUP

	VDP				MEFUP			
	No	CR	PR	%	No	CR	PR	%
Lymph nodes ..	21	16	2	86	15	4	5	60
Skin ..	17	5	6	65	13	2	3	38
Breast ..	15	7	4	73	6	3	1	67
Lung ..	6	2	2	67	8	1	3	50
Pleura ..	11	3	4	64	9	2	1	33
Liver ..	9	2	4	67	6			
Bone ..	19		5	26	25			

CR = complete remission
PR = partial remission

Discussion

This wide variation in objective response in different sites is consistent with the experience of others using similar regimens,^{1,2} but has perhaps been inadequately emphasised. While chemotherapy may improve marrow infiltration dramatically³ and sometimes provide transient pain relief, we seldom see sustained objective responses in bone. This cannot be wholly due to the relatively insensitive methods for assessing the response in bone because the same techniques will detect rapid bone healing after successful endocrine treatment.⁴ Possibly such treatment has an anti-osteolytic property which chemotherapy lacks. Moreover, responses to chemotherapy tend to be shorter than those to endocrine treatment so a good endocrine response will be preferable to a good chemotherapy response. Clearly, chemotherapy has a major part to play in the management of metastatic breast cancer and we would agree with Priestman *et al*⁵ that this part may have been underrated. Nevertheless, we think that overall assessment of response to any treatment in a heterogeneous group of patients may be very misleading and that whenever systemic treatment is selected for a particular patient the predominant site of symptomatic disease should be a major consideration.

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² Canellos, G, *et al*, *British Medical Journal*, 1974, **1**, 218.

³ Dady, P, *et al*, *British Medical Journal*, 1977, **1**, 554.

⁴ Stoll, B A, in *Endocrine Therapy in Malignant Disease*, ed B A Stoll, p 111. London, Saunders, 1972.

⁵ Priestman, T J, *et al*, *British Medical Journal*, 1977, **1**, 1248.

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Meningeal reaction to starch powder in the cerebrospinal fluid

There have been many reports of surgical glove powder causing granuloma formation in various tissues of the body,¹ most notably peritoneum, but not of reaction to starch after neurosurgical operation. We report what is apparently a meningeal reaction to surgical glove powder in the cerebrospinal fluid.

Case report

A previously fit 53-year-old bricklayer developed ataxia and vertigo over eight months. EMI scan showed a large 4th ventricle lesion that was removed at craniectomy in 1977. Histology disclosed a subependymoma. Post-operatively he was treated with betamethasone, initially 6 mg three times a day and then in decreasing doses over the next two weeks. His symptoms improved, and at 13 days he was transferred back to his original hospital for further convalescence before going home. After transfer he developed a pyrexia of 38°C associated with general malaise and neck stiffness. A lumbar puncture 14 days after operation disclosed a large number of cells, many of which could not be identified as polymorphs or lymphocytes. He was returned to our care 15 days after operation.

Starch granules cuffed by inflammatory cells under polarised light showing birefringence. (Stained with haematoxylin and eosin and shown at a magnification of $\times 656$.)

On return he was pyrexial (38.5°C), with neck stiffness. The white cell count was $11.1 \times 10^9/l$ ($11\ 100/mm^3$). A further lumbar puncture was performed, which produced bright yellow fluid at a pressure of 180 mm cerebrospinal fluid (CSF) with free rise and fall and the following composition—white cell count $150 \times 10^6/l$ ($150/mm^3$) (80% polymorphs, 20% mononuclears), red cell count $30 \times 10^6/l$ ($30/mm^3$), protein 1.7 g, and sugar 1.0 mmol/l. A spun deposit of CSF showed polymorphonuclear leucocytes and many large phagocytic cells. Throughout the films were rounded bodies that stained positively with iodine and periodic acid Schiff and showed maltese-cross birefringence under polarised light. These reactions are typical of starch granules. Almost all these bodies were surrounded by cells. No bacteria were seen, and culture was negative. A presumed diagnosis of starch meningitis was made, and he was again treated with betamethasone. A further lumbar puncture was performed five days later, removing 30 ml of CSF in an attempt to dilute the starch concentration. This showed a similar picture, but with less starch and a higher percentage of phagocytes. The pyrexia and neck stiffness settled over five days, and he was discharged after a further five days.

Comment

We think that this is a genuine meningeal reaction to starch. In both CSF specimens examined at this hospital almost every starch granule was surrounded by a collar of inflammatory cells, and occasional macrophages with large cytoplasmic vacuoles, suggestive of absorption of starch granules, were present. This unusual appearance may explain the initial difficulty in identifying some mononuclear cells. Although no starch granulomata were seen, these observations make it unlikely that the appearances were due to simple contamination.

tion of the specimen.² Furthermore, the patient's symptoms developed only after betamethasone was withdrawn. They subsided with further betamethasone and the removal of 30 ml CSF.

This case may not be unique. Surgical gloves carry a large quantity of starch powder, and we suggest that neurosurgeons adopt the precaution of washing off this powder³ before undertaking any surgical procedure.

We wish to thank Mr B H Cummins and Dr D B Brownell for their advice, Mr B H Cummins for permission to report the case, and all those who have provided secretarial and technical help.

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Tubo-ovarian actinomycosis and the IUCD

Actinomycotic infection is not common in the UK, about 40 cases being reported annually,¹ and infection of the female genital tract is rare. The route of such infection was formerly thought to be by extension from established ileocaecal disease² but more recently it has been suggested the presence of an IUCD may have a causal role.³ We present a case of tubo-ovarian actinomycosis in association with an IUCD.

Case report

A 37-year-old woman, para 2 + 0, was admitted to hospital in December 1976 with a 7-day history of increasingly severe lower abdominal pain and anorexia. She had had a profuse offensive vaginal discharge for two months. She had no history of amenorrhoea and an IUCD had been fitted three years previously. She was pale and ill-looking, but afebrile. Relevant clinical findings were confined to the abdomen and pelvis. She had generalised abdominal tenderness and guarding, maximal in the iliac fossae. Rebound tenderness was present and bowel sounds were absent. A limited pelvic examination was possible and disclosed a foul vaginal discharge and a healthy cervix. There was appreciable cervical excitation pain and acute adnexal tenderness. The uterus appeared normal in size. The haemoglobin was 12.6 g/dl, the WBC $11.1 \times 10^9/l$, and the blood film normal. The result of urine analysis and x-ray films of the chest and abdomen were normal. A

presumptive diagnosis of ruptured pelvic abscess was made and emergency laparotomy carried out. On opening the peritoneum, 200 ml of foul smelling green pus were found free in the abdominal cavity. No sulphur granules were observed in the pus. Both tubes and ovaries were implicated in large infected masses, to which large and small bowel were adherent. The bowel was freed by blunt dissection and bilateral salpingo-oophorectomy was carried out. Hysterectomy was not carried out. After thorough peritoneal toilet and instillation of 200 ml Noxyflex, a large corrugated drain was inserted into the pouch of Douglas and the abdomen closed. The IUCD, a Saf-T-Coil, was removed.

On pathological examination, the ovaries and fallopian tubes contained multiple abscesses filled with green pus. Microscopically, continuing inflammation was present, with abscess formation centring on colonies of actinomyces, the typical sulphur granules being clearly seen (see fig). Cultures from high vaginal swabs and the IUCD were sterile but *Actinomyces israelii* was grown in glucose-agar shakes, after four weeks' incubation of abdominal pus samples.

The patient made a satisfactory postoperative recovery. Initial antibiotic cover with gentamicin and lincomycin was changed to parenteral benzylpenicillin when the histological diagnosis was made. A search was made for possible cervicofacial or thoracic sites of actinomyces infection with negative results, and the patient was discharged home on a three-month course of oral phenoxymethylpenicillin. She has remained well.

Comment

Actinomycotic disease of the ovaries and fallopian tubes may be caused by direct extension from bowel, by lymphatic or vascular routes, or by direct ascension of the genital tract. In our patient the short clinical history of illness or absence of obvious bowel disease is thought to indicate that the IUCD may well have been the causative factor.

The possible association between tubo-ovarian actinomycosis and the IUCD was first suggested 50 years ago,⁴ and metallic devices have been particularly incriminated, possibly as they provide a focus for infection together with a chemical reducing action favourable for an opportunistic anaerobe such as *A. israelii*. Nevertheless, the IUCD need not be metallic, as is shown in this case. We hope that actinomyces will remain a rare cause of genital infection, but the continuing popularity of the IUCD as an alternative to oral contraception and the increasing use of copper devices mean that actinomycotic infection should be considered in IUCD wearers who present with clinical evidence of pelvic inflammation.

¹ *British Medical Journal*, 1977, **1**, 1037.

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³ Brenner, R W, and Gehring, S W, *Obstetrics and Gynecology*, 1967, **29**, 71.

⁴ Draper, J W, and Studdiford, W E, *American Journal of Obstetrics and Gynecology*, 1926, **11**, 603.

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Right-sided diaphragmatic hernia: neonatal presentation associated with an unusual physical sign

Diaphragmatic hernia is a well-recognised cause of respiratory difficulty soon after birth. Recently, however, attention has been drawn to the fact that right-sided diaphragmatic hernia (RDH) often presents later and atypically.^{1,2} In these two cases of RDH an unusual physical sign was present, which may help in diagnosis.

Case 1

A 32-week, 1980 g girl developed clinical and radiological features of idiopathic respiratory distress syndrome one hour after an uneventful birth.

Right ovary. Colony of actinomyces with surrounding inflammatory response. Sulphur granule. (Methenamine silver.)