

Silicone in the sputum after rupture of a calf implant

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J R Soc Med 2001;94:133–134

Silicone-filled prostheses have been used as medical implants for nearly 40 years, but the systemic consequences of rupture remain uncertain.

CASE HISTORY

An otherwise healthy woman aged 27 sought advice 5 years after having bilateral calf implants inserted in Brazil for cosmetic augmentation of thin calves. Each implant contained about 175 mL of silicone gel. For the past eighteen months the patient had experienced right calf swelling and pain, with difficulty putting her foot flat on the floor. She attributed various non-specific symptoms such as lethargy, gastritis and backache to the implants and also reported that she intermittently coughed up a lumpy and sticky substance, a sample of which she provided. This had an unusual gelatinous appearance and was sent for histological, electronmicroscopical and chemical analysis. There were no symptoms or signs of lung disease; chest X-ray and computed tomographic scan were normal, as were liver ultrasound and blood indices. Ultrasound indicated leakage from the right implant, and magnetic resonance imaging revealed a surrounding fluid-filled pseudocapsule. After removal under general anaesthesia both implants proved to be ruptured, and the presence of altered blood throughout the right implant suggested perforation at the time of insertion. Electronmicroscopy of the sputum revealed near-uniform granular deposits about $2\ \mu\text{m}$ across (Figure 1), corresponding morphologically to silicon oxide and identical to a sample from the explanted prosthesis. On evaluation by energy dispersive analysis of X-rays (EDAX), the silicone in sputum exactly matched that from the prosthesis (Figure 2) and was contained within an amorphous background material high in sulphates and phosphates suggestive of tissue origin.

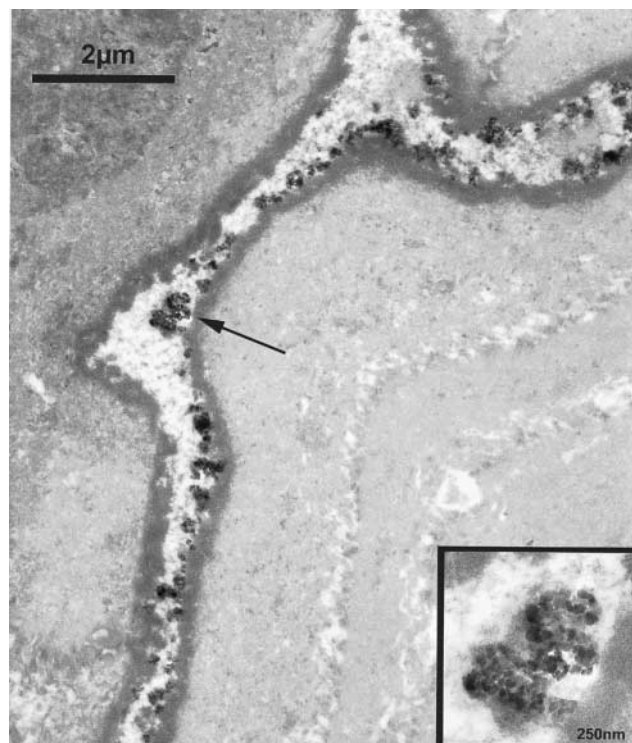


Figure 1 Electronmicrograph of sputum sample. Insert (arrow) shows silicone oxide granules

COMMENT

Much of the concern about silicone-gel-filled prostheses relates to breast implants¹. The systemic effects of silicone gel released by rupture are uncertain², but an alleged excess of connective tissue diseases has not been confirmed³. Wear debris from silastic finger joints has been associated with axillary lymphadenopathy and malignant lymphoma^{4,5}. After rupture of breast implants, silicone has seemingly gained entry to the nipple ducts, axillary nodes, pleura, chest wall and upper arm⁶. The early practice of direct injection of silicone was abandoned because of widespread adverse effects.

There are nine reported cases of pneumonitis or acute lung injury following the accidental direct intravascular injection of silicone fluid⁷. In some of these cases silicone was detected within macrophages after bronchoalveolar lavage, and the mechanism of lung damage was thought similar to that after fat embolism in which microvascular occlusion, followed by local serotonin release, platelet adherence to emboli and degranulation, can produce acute lung injury. Factors implicated in the rupture of breast implants are implant age, trauma to the breast (including closed capsulotomy, in which manual pressure is used to break up local fibrous tissue around an implant) and mammography. Implants positioned within the calf are under greater mechanical forces which could possibly lead to early rupture with extrusion of silicone gel locally.

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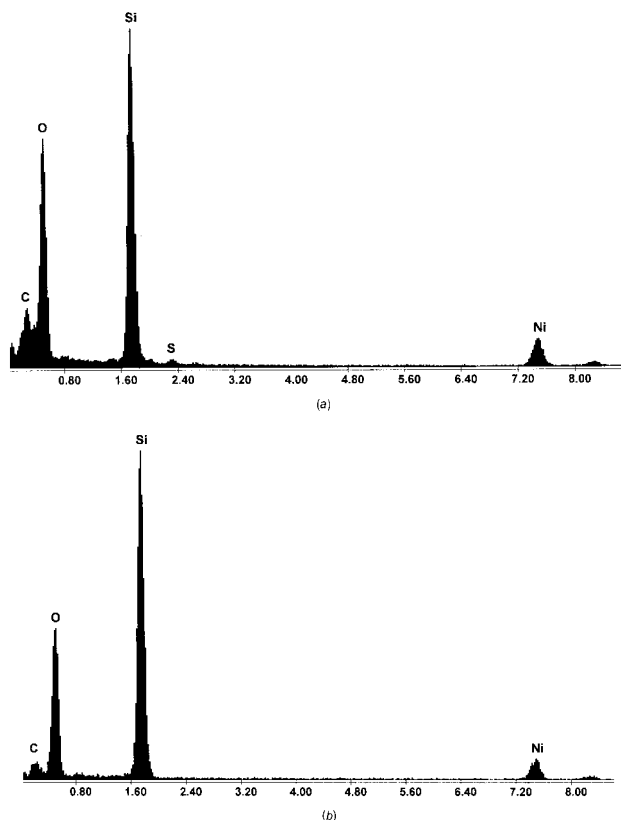


Figure 2 EDAX analysis of silicone particles in sputum sample (above) and from right calf implant (below)

We think this is the first reported case of silicone expectoration after rupture of a silicone-gel filled implant. The mechanism of migration is unclear. We speculate that the gel, extruded under high pressure, gained entry to the vasculature and embolized in the lungs.

Acknowledgment We thank Mrs Jackie Lewin for valuable assistance with electronmicroscopy.

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Seven recurrences of spinal inflammation

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J R Soc Med 2001;**94**:134–135

Recurrent spinal inflammation without spinal cord compression is a clinical entity of unknown aetiology. Fewer than twenty cases have been reported since its description by Tippett *et al.*¹

CASE HISTORY

A woman aged 24 was admitted with a 10-day history of severe back pain, bilateral lower limb dysaesthesia, left leg weakness and hesitancy of micturition. The symptoms were of subacute onset and were steadily progressing. She had been well previously and there had been no preceding infective illnesses or immunizations. The right eye had long been amblyopic. Her sister was known to have multiple sclerosis (MS), probably of primary progressive type. On examination she had a bilateral, asymmetrical, spastic paraparesis with extensor plantar responses. There was a sensory level at T4 with sparing of sacral segments. Cranial nerves, fundoscopic appearances and higher mental function were normal. She was afebrile. A full-length myelogram was normal and the cerebrospinal fluid (CSF) showed no oligoclonal bands, only a non-specific lymphocytic reaction (16 cells/ μ L). Chest radiography, angiotensin converting enzyme level, erythrocyte sedimentation rate, anti-nuclear factor, mitochondrial antibodies and smooth muscle antibody levels were normal or negative, as were serological tests for syphilis and borrelia. She was presumed to have transverse myelitis or idiopathic spinal cord inflammation. On treatment with intramuscular dexamethasone she made a good symptomatic and functional recovery, including bladder function. At follow-up 20 weeks later, she was walking independently without aids. There was some residual lower limb dysaesthesia and spasticity.

Over the ensuing 13 years she experienced seven identical episodes of probable spinal cord inflammation, all affecting roughly the same spinal cord level. Magnetic resonance (MRI) scans of the head undertaken on two

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occasions (3 years and 6 years after her original illness) were normal. Spinal MRI performed during a quiescent period (11 years after her original presentation) showed no abnormalities, including in the thoracic region. Her CSF has been examined on a further two occasions (at 3 years and 11 years) and has shown no oligoclonal bands. On each recurrence the transverse myelitis responded impressively to parenteral steroid therapy, with rapid improvement of motor and bladder function. In recent years she has developed persistent mild sensory impairment in the lower limbs. Between attacks her general health has been good.

COMMENT

Recurrent transverse myelitis is thought to be distinct from both MS and the commoner monophasic form of this illness. After the original report of three patients by Tippett *et al.*,¹ Djaldetti and co-workers described one further case². Since then about eighteen more have been reported. They do not have any obvious features in common. Systemic lupus erythematosus, myasthenia gravis and *Herpes simplex* type 1 virus infection have been reported in single cases^{3–5}, and Japanese clinicians have found raised p-ANCA, phospholipid antibodies and hepatitis B surface antigen, again in individual cases. All had unremarkable head MRI scans. Cord swelling on spinal MRI, occurring at the same (usually thoracic) level on each occasion, has been seen, especially if the investigation was done acutely. Oligoclonal bands were never seen. All responded well to parenteral steroid therapy.

The present case is the first in which a first-degree relative was affected by MS. The sister succumbed to her illness at the age of 27, after a 6-year history of progressive disability without remission; we have been unable to obtain information about her investigations. During 13 years of unbroken follow-up, our patient has no shown clinical or laboratory features of MS.

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Herpetic trigeminal trophic syndrome in an infant

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J R Soc Med 2001;**94**:135–137

SECTION OF DERMATOLOGY, 20 JANUARY 2000

Trigeminal trophic syndrome is an ulcerative condition of the face particularly involving the ala nasi. It most commonly affects adults, after iatrogenic, vascular or neoplastic damage to the trigeminal nerve.

CASE HISTORY

A boy aged 14 months was referred with a four-week history of crusting affecting the right external nares. Two weeks before the onset of crusting, he and his three sisters had experienced typical herpes labialis, *Herpes simplex* being identified in swabs taken for virological investigation. The sisters had had previous attacks. On examination, crust was occluding the boy's right external nares, with inflammation of the septum and partial loss of the right ala nasi (Figure 1). He was growing normally and had passed all his developmental milestones satisfactorily. Herpes infection with secondary bacterial infection was suspected and swabs taken from the edge of the crusted area at this time subsequently revealed infection with *Herpes simplex*. Oral aciclovir (200 mg five times daily), oral flucloxacillin (62.5 mg four times daily) and topical triclosan (2%) washes were prescribed, each for seven days. There was no improvement and after a further three weeks he was referred to the ear, nose and throat service for examination under anaesthesia and biopsy of the inflamed area to rule out a foreign body, centro-facial neoplasm or Wegener's granulomatosis. No foreign body was found and a nasal mucosal biopsy specimen was histologically normal. He was then referred to the paediatric service. After two infusions of aciclovir (50 mg/24h), oral aciclovir (200 mg twice daily for three months) was prescribed for presumed recurrent *Herpes simplex* infection (although viral swabs were now negative). The child was investigated extensively for evidence of susceptibility to infection as well as for other possible causes of the lesion. Investigations included serum

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Figure 1 Appearance of child's nose on first referral

protein electrophoresis, immunoglobulins, complement, markers of cellular immunity (lymphocyte adhesion molecules, neutrophil function studies, lymphocyte subclasses), inflammatory markers (C-reactive protein, erythrocyte sedimentation rate), vasculitis screen (immune complexes, antinuclear factor, extractable nuclear antigens, antineutrophil cytoplasmic antibody), Mantoux test, *Treponema pallidum* haemagglutination test, renal and hepatic function tests and full blood count. No abnormalities were found. During an inpatient stay he was accommodated in a cubicle closely observed by nursing staff to rule out non-accidental injury. A good bond was observed between the child and his mother and at no time was deliberate trauma to the nose observed. At dermatology review three months postoperatively, the crusting was still present although milder and the loss of the ala was no longer progressive. Viral swabs were negative. The patient was carefully observed but was seen to pick at the affected area only occasionally. He did invariably have bloody crust material under his fingernails, however, indicating that he had picked at the area.

The inflammation gradually subsided and was quiescent for six months, but ulceration recurred fifteen months and twenty-one months after the original referral, with vesicular herpetic lesions on the right cheek on the second occasion. Vesicle fluid contained *Herpes simplex* virus which was not resistant to aciclovir. Now that the boy can communicate better, the parents are able to dissuade him from further traumatizing the area.

COMMENT

We feel that this patient has trigeminal trophic syndrome (TTS) secondary to *Herpes simplex* trigeminal neuritis, rather than recurrent herpetic ulceration or TTS from another cause. Intermittent recurrences of *Herpes simplex* infection at this site may nonetheless have contributed to the tissue damage.

TTS occurs in association with trauma to the sensory elements of the trigeminal ganglion, usually after ablation for trigeminal neuralgia¹. It may also occur after infarction of the posterior cerebellar artery, with brainstem neoplasms or their treatment² or in association with infections, particularly *Varicella zoster*³, *Herpes simplex*⁴ and leprosy trigeminal neuritis⁵. The ulceration and tissue damage is thought to result from self-mutilation triggered by the paraesthesia or dysaesthesia. Having not yet learned to speak at initial presentation our patient was unable to report any altered sensation, although by refusing examination of the area he did indicate discomfort. Because of his young age and lack of cooperation, formal neurological examination to delineate an area of dysaesthesia was not possible. For the same reasons nerve conduction studies were not undertaken.

TTS is usually a disease of adults. In reported cases the age range is 26–94 years (mean and median 60 years), with a female preponderance. Impaired cognitive function, particularly dementia⁶, is thought to promote the condition (partly because patients cannot be dissuaded from traumatizing the affected area). The same may apply to very young children such as our patient. Some patients report burning, pruritus or formication. Of eight patients with TTS described by Schorstein⁷, seven experienced such troublesome paraesthesias that they repeatedly traumatized the nasal skin.

Therapeutic approaches include transepidermal nerve stimulation⁸ and various neurotropic agents. Carbamazepine⁹ and diazepam and amitriptyline¹⁰ have been reported effective in adults, as has pimozone in one cognitively impaired elderly patient¹¹. Sublesional steroid combined with aciclovir is said to be effective for herpetic TTS⁴. Surgical repair of the defect with innervated flaps from the contralateral ala nasi or from the forehead¹² has given good long-term results but this approach will fail unless the patient stops traumatizing the area². Protective devices can be worn at night³. Unfortunately the ulceration in TTS commonly persists, particularly in the elderly¹³ or in confused patients who compulsively pick at the skin. The prognosis is likely to be more favourable in children such as our patient, who now understands the need to avoid further trauma to the area.

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Metastatic *in-situ* perianal Paget's disease

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J R Soc Med 2001;**94**:137–138

Perianal Paget's disease is an *in-situ* or invasive adenocarcinoma commonly associated with an underlying visceral malignancy. To date, there has been no reported case of metastasis from an apparently *in-situ* perianal Paget's lesion without underlying carcinoma.

CASE HISTORY

A man aged 69 had an 18-month history of puritus ani and a perianal rash. Despite topical treatments the pruritus persisted and the area of the red rash increased. There was no history of rectal bleeding or other gastrointestinal symptoms. He had no family history of colorectal cancer.

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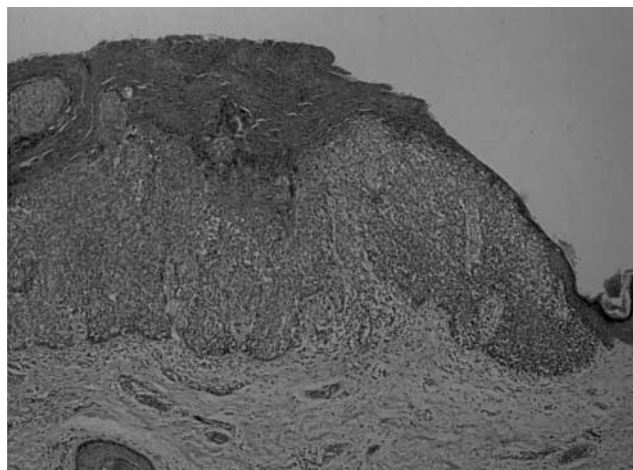


Figure 1 *In situ* perianal Paget's disease. Haematoxylin and eosin (×20)

On examination, there was an oval area of erythema in the right anterior area of the anal margin, extending up to the dentate line, suggestive of Paget's disease. This area included a posterolateral skin tag which had a raised and slightly irregular appearance. Biopsy confirmed the diagnosis of Paget's disease. Findings on proctosigmoidoscopy, barium meal and follow-through were all normal. Colonoscopy revealed only two small (3 mm) polyps in the descending colon, which were shown to be mildly dysplastic tubular adenomas. Wide local excision of the full thickness of perianal skin and anal mucosa achieved 1 cm clear margins macroscopically. Histological examination of sections throughout the specimen revealed *in-situ* disease only (Figure 1). The skin edge was undermined and advanced to cover the defect. Skin grafting with a defunctioning colostomy was not required.

Six months later the patient noticed swelling of his right leg and a lump in the groin. On examination he had pitting

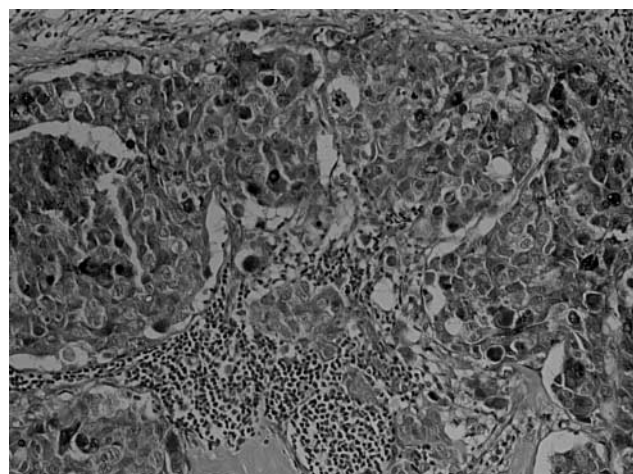


Figure 2 Lymph node infiltrated by metastatic Paget's cells. Haematoxylin and eosin (×400)

oedema to the lower thigh and right inguinal lymphadenopathy. An ultrasound scan showed multiple enlarged lymph nodes along the iliac vessels and the aorta. On excision biopsy a node from the right groin showed infiltration by Paget's cells with the same characteristics as the index lesion (Figure 2). Serum carcinoembryonic antigen was raised at 128.9 ng/mL (reference range 0–3.5 ng/mL) but other tumour markers were normal. A computed tomographic (CT) scan confirmed the lymphadenopathy and strengthened the suspicion of metastatic involvement. The liver was clear.

The patient received two cycles of infusional 5-fluorouracil and intermittent bolus mitomycin C, followed by radiotherapy to the involved lymph nodes and synchronous infusional 5-fluorouracil. A total of 4500 Gy was given in 25 fractions over five weeks with a linear accelerator. Treatment continued with cisplatin, mitomycin C and infusional 5-fluorouracil over 6 weeks. A good response to treatment was seen clinically and on repeat CT imaging. Eleven months after completion of treatment, the disease relapsed with extensive intra-abdominal lymph node enlargement and hepatic lesions on CT scan. Biopsy of the lymph nodes confirmed recurrence of the disease, which was still *in situ* only. The patient died three months after relapse of the disease.

COMMENT

The diagnosis of perianal Paget's disease (PPD) should be considered in any patient with pruritus ani and a rash that does not respond to conventional therapy within a month. PPD is associated with underlying visceral carcinoma in 33–86% of reported cases, so the patient should be thoroughly investigated for associated gastrointestinal malignancies¹.

The lesion of perianal Paget's disease has a characteristic microscopic appearance. Rounded, large, faintly basophilic or vacuolated cells are located in the epidermis. The large and vesicular nuclei with little mitotic activity are often displaced to the periphery of the cell, in a signet ring appearance. These Paget cells stain positively with alcian blue and periodic acid–Schiff because of the high content of mucin in their cytoplasm. They also contain carcinoembryonic antigen, which can be detected by immunofluorescence or immunohistochemistry².

The origin of Paget cells remains controversial. One view is that they arise from carcinomatous transformation of pluripotential cells in the epidermis. Another is that they originate from an *in-situ* adenocarcinoma extending from apocrine sweat glands along sweat ducts. Armitage *et al.*³ have advanced this hypothesis by suggesting that primary PPD arises from apocrine glands of the epidermis whereas

secondary PPD is an extension of anal/rectal adenocarcinoma into the epidermis, analogous to mammary Paget's disease.

In-situ PPD may be treated by wide local excision. Clear margins on microscopic assessment are important, since Paget cells may extend beyond the obvious margins of the lesion². The postoperative defect, depending on its size, can be covered by local flaps, split-thickness skin grafts, cutaneous flaps, or myocutaneous flaps. A covering colostomy may be required. Invasive PPD or lesions associated with synchronous malignancies (anal/rectal carcinomas) should be treated by abdominoperineal excision^{1,2}. Perianal Paget's disease has a high rate of local recurrence, reported in up to 61% of cases in 5 years¹. Recurrences may be treated by another wide resection, unless the patient develops invasive disease.

This patient had a primary *in-situ* perianal Paget's disease which metastasized. This has never previously been reported for non-invasive PPD. However, there have been reports of invasive extramammary Paget's disease (EPD), without underlying malignancy, which have metastasized^{4,5}. These cases of metastatic EPD have included perianal Paget's disease, although most have been genital in origin^{4,6}.

Although the role of chemotherapy and radiotherapy in the management of metastatic extramammary Paget's disease has not been fully assessed, combination chemotherapy has been reported to be well tolerated and resulted in remission of the tumour in cases of advanced unresectable EPD^{4,6}. Furthermore, mitomycin C is reported to be effective in combination with other agents such as 5-fluorouracil, doxorubicin, vincristine and cisplatin in primary and metastatic EPD^{4–6}.

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