Detail from *The Election 1. An Election Entertainment* by Hogarth. By courtesy of the Trustees of Sir John Soane's Museum

was still suffering from diverticulitis. Examination showed him to be fit without abnormal physical signs in the nervous or general medical systems. He had no abnormalities in or around the right ear. His blood pressure was 135/85 and his urine free of protein and sugar.

I explained to the patient and his wife that I had not encountered this before but wondered whether the pain arose from the vagus and was referred by Arnold's nerve (explained in lay terms). I also told him about the Alderman's trick of touching the back of the pinna with a cold damp napkin to promote gastric

peristalsis.^{1,2} More practically, I advised taking antacids prophylactically immediately after breakfast, which he ate at 8.30 am, and after his evening meal. Follow up 10 months later by telephone (he failed to keep a two month follow up appointment) showed that he had sought a further opinion and had been taking ranitidine 300 mg night and morning initially and had recently reduced the dose, taking one tablet only in the evenings. He had had no further pain in his right ear or head.

Comment

This case supports the hypothesis that unilateral facial pain may be referred by the vagus. Bindoff and Heseltine recorded eight patients in whom a lung carcinoma provoked unilateral facial pain predominantly in the jaw³; in five of the eight they specifically mentioned pain in the ear on the same side. My patient supports their view but shows that the cause may be benign.

Pain in the ear or pressure across the bridge of the nose are "heart sinkers" because usually there is no cause to be found and we are bereft of ideas on pathogenesis or treatment. This case report, however, shows that auricular pain, albeit rarely, may arise from a hiatus hernia. Perhaps gastroenterologists have encountered this picture or might look out for this syndrome in the future.

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245 Eyelid abscess in an egg nog drinker

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A substantial increase in salmonella infections has been reported recently; this has been partly accounted for by an increase in infection with *Salmonella enteritidis* phage type 4, transmission of which has been associated with eggs. Unlike *S typhi* and *S paratyphi* type A, for which rates of bacteraemia of 63% and 71% respectively have been reported, *S enteritidis* is thought to be less invasive, with a bacteraemic rate of only 1%.¹ Correspondingly, extraintestinal salmonellosis has been less commonly reported with *S enteritidis*. We report a recent case of *S enteritidis* infection presenting with an upper eyelid abscess in an egg nog drinker.

Case report

A 72 year old West Indian, resident in England since 1950, presented to the ophthalmology department with a large abscess of the left upper eyelid that developed over two weeks. He gave no recent history of gastrointestinal symptoms. The abscess was drained under general anaesthetic; it extended to the periosteum of the frontal bone, though the periosteum itself seemed intact. He was treated with flucloxacillin and fusidic acid. The next day culture of the pus grew *S enteritidis* (identified as phage type 4) sensitive to ampicillin, cephalosporins, and gentamicin. The antibiotics were changed to intravenous cefotaxime. He still had a fever (39.5°C), and a technetium isotope scan showed extensive uptake in the left frontal bone extending well above the supraorbital ridge (figure). Computed tomography showed a 2 cm lytic lesion in

the left frontal bone above the left superior orbital ridge. Surgical exploration confirmed frontal osteomyelitis, and the cavity was drained; bilateral maxillary antral washouts were also performed. The next day his temperature was normal, and he made a good recovery, with three weeks of intravenous and then three weeks of oral cephalosporin. Electrophoresis of haemoglobin yielded normal results.

Technetium bone scan showing increased uptake in periorbital region and frontal bone

His diet consisted of West Indian and European food, but he said that he cooked all eggs well. When he was seen in the outpatient department he was specifically asked if he drank egg nog, and he then admitted drinking it frequently, using a recipe of raw eggs, brandy, sugar, milk, and vanilla essence.

Comment

We can find no previous reports of *S enteritidis* infection presenting as an eyelid abscess. Probably our patient had a subclinical gastrointestinal infection and subsequent bacteraemia with distant seeding possibly in a rudimentary frontal sinus. Gastrointestinal infection with salmonella is more likely to lead to bacteraemia in those with underlying disease, especially gastric disorders. It is also much more common in the over 70s, the rate of bacteraemia in this age group being two to four times that in young adults.^{1,2} Although rare, with the great increase in *S enteritidis* infections extraintestinal infection is likely to become more common, especially in elderly and ill patients. In such cases the possibility of underlying osteomyelitis should be considered as it has important therapeutic implications, needing prolonged treatment with antibiotics and often an operation. Salmonella osteomyelitis is classically associated with sickle cell anaemia, though

our patient's haemoglobin was normal. In about two thirds of cases salmonella osteomyelitis affects the long bones.³ One case of frontal bone osteomyelitis caused by *S paratyphi* has been reported.⁴

From 1981 to 1986 the proportion of salmonella infections caused by *S enteritidis* rose from 11% to 28%.⁵ This rise was due mainly to a rise in phage type 4 infections; transmission of this phage type has been increasingly associated with poultry, and it is now known to be transmitted in eggs. Egg borne *S enteritidis* is destroyed by thorough cooking. The raw egg in the egg nog may have been the vehicle of infection. Unless specifically asked for a history of egg nog drinking may not emerge on dietary questioning.

We thank Dr P Isphani for her help with the case, Professor J Hampton for permission to report the case, and Suzanne Watson for typing the script.

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"Let's twist again"

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New bone formation on both sides of tibia suggesting spiral fracture

Delayed x ray pictures may be important in patients in whom stress fractures are suspected. The full x ray picture should be studied even when one site of fracture is found because spiral stress fractures are possible, though rare.

Case report

A 21 year old man presented to the accident and emergency department complaining of severe pain in his left lower leg. A week previously, while on holiday abroad, he had hurt his leg when disco dancing. He admitted to many "heavy dancing sessions" lasting several hours, including dancing with his girlfriend on his shoulders, during his holiday. The pain had been sudden and severe and persisted when he returned to the United Kingdom. A stress fracture was suspected, but x ray pictures did not show any abnormality so he was advised to rest. Three days later his lower leg was warm to touch and seemed mildly inflamed without bony tenderness. After a further four days he complained of persistent, worsening pain in his lower leg with difficulty in bearing weight. An isotope bone scan showed distinct irregular uptake in the distal half of his left tibia extending to the ankle joint. The appearances were not classic for a stress fracture, and secondary osteomyelitis was considered a possibility.

The patient was systemically well, with no fever, a white cell count of $6.3 \times 10^9/l$, and an erythrocyte sedimentation rate of 1 mm in the first hour. A second plain x ray picture of the lower tibia showed a periosteal reaction at the midshaft. He was therefore treated conservatively and advised to use the leg gently with crutches. Three months after the initial injury he had recovered fully. Another plain x ray picture showed an unusual appearance. There were two areas of periosteal reaction, one above the other but on either side of the

tibia, suggesting that the initial injury was a spiral stress fracture (figure). With hindsight the second area of periosteal elevation (corresponding to B in the figure) could be seen in the second plain x ray picture.

Comment

There are two main theories about the cause of stress fractures.¹ Firstly, the fatigue theory states that muscles pass their peak of endurance during protracted effort and are no longer able to support the skeleton; the load is therefore transferred directly to the bone. Secondly, the overload theory states that muscle groups when contracting cause the bones to which they are attached to bend like a drawn bow. After repeated contractions the innate strength of the bone is exceeded and it breaks. Morris suggests that within the first two weeks of symptoms the bone undergoes osteoclastic activity resulting in local osteoporosis.² Periosteal and endosteal calluses then begin to form. Excessive stress during the stages of osteoporosis or early callus formation may result in a cortical crack or a complete fracture. Swelling, occasionally to the point of pitting oedema, occurs and is often rather diffuse. Less commonly, the affected part is erythematous with an associated increase in temperature on palpation as was noted in our case.

Symptoms begin insidiously in half of cases and acutely, without apparent injury, in the other half. Two fifths to a half of x ray pictures show changes initially, but first signs may be evident only after three to four weeks. Our patient was typical in his presentation, but spiral stress fractures are quite unusual. We could find only one other reported case.³

I thank Major General Kirby for his help in compiling this report and Miss J Clancey for her typing skills.

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