A man with swollen calf and discoloration of the foot

Q1: What is the likely diagnosis?
The differential diagnosis of calf swelling includes deep vein thrombophlebitis, a popliteal cyst, popliteal varices or artery aneurysm, ganglia, neural tumours, sarcoma, and haemangiomia.

When the swelling is associated with tenderness, diagnostic considerations should include tear of medial head of gastrocnemius origin, popliteal fascia cellulitis, fasciitis, compartment syndrome, venous insufficiency, and ruptured popliteal cyst.1

One of the most common and clinically important diagnosis is DVT. Since it leads to pulmonary embolism, prompt anticoagulation is indicated. On the other hand, anticoagulation after ruptured Baker's cyst can cause bleeding and posterior compartment syndrome.2

Q2: What physical examination sign was the clue for the final diagnosis?
Ruptured Baker's cyst simulates DVT of the calf veins, both causing painful, swollen calf with overlying skin erythema. Homan's sign, an accepted but non-sensitive sign, may also appear in both. Ecchymosis of the foot, especially in a malleolar region, termed the haemorrhagic crescent sign, has been reported after this rupture. Although this is a relatively rare finding, it is not found in DVT and its presence should lead the clinician to the diagnosis of ruptured Baker's cyst.3

Q3: What are the diagnostic modalities you would use to confirm the diagnosis?
Ultrasound (duplex scan) is the method of choice for evaluation of posterior calf disease, although it may be difficult to distinguish Baker's cyst from its after rupture. Recently, with improvement of ultrasonic images, this method can simultaneously confirm ruptured Baker's cyst and exclude DVT. Alternative imaging modalities are magnetic resonance imaging and computed tomography. Previously, the gold standard diagnostic method for ruptured Baker's cyst was an arthrogram. In this procedure the knee joint is injected with radio-opaque dye which can cause bleeding and posterior compartment syndrome.4

Q4: What treatment is indicated?
Ruptured Baker's cyst is treated by elevating the affected extremity, local heating, and intra-articular corticosteroid injection after aspiration of the synovial fluid from the knee.

Discussion
In our patient diagnosis of ruptured Baker's cyst was confirmed by ultrasound examination obtained during his visit to the rheumatology clinic. A fluid collection along the intermuscular fascia layers of the calf (fig 1 below) was demonstrated. The patient was treated as described above, with disappearance of the symptoms within two weeks.

Popliteal cyst is usually caused by tear of the knee joint capsule, allowing a communication between the joint space and gastrocnemius or semimembranous bursa. It was named after the British surgeon William Morton Baker, who described an association of this cyst with knee synovitis. Popliteal cysts are secondary to degenerative (osteoarthritis) or inflammatory arthritis with increased synovial fluid production. The most common complication of Baker's cyst is a rupture. This is usually caused by a rise in intra-articular pressure during powerful knee extension.

Extravasation of inflammatory and proteolytic content of synovial fluid leads to inflammation of surrounding calf structures. The patient with a ruptured cyst will therefore present with a hot, red, tender and swollen posterior calf, while the cyst is no longer palpable, and the knee is less swollen. Homan's sign may be positive in both DVT of the calf and ruptured Baker's cyst. Thus the two entities are almost indistinguishable by physical examination.

The only clinical sign differentiating ruptured Baker's cyst from DVT is bruising below the malleolus. This results from drainage of inflamed synovial fluid dissecting the calf structures to the foot. Discoloration of the malleolus area should therefore alert the physician to the diagnosis of ruptured Baker's cyst.

Finally, DVT and Baker's cyst are not mutually exclusive diagnoses as the cyst pressure on a calf vein may cause stasis and thrombosis.5

Final diagnosis
Ruptured Baker's cyst.

References

Figure 1 Ultrasound of the posterior medial site of the left calf, showing an anechoic lesion 34.1 x 7.6 mm with some echogenic debris on the dependent side.

Young male with pancytopenia: an unusual cause

Q1: What is the finding on slide of bone marrow examination (fig 1; see p 300)?
The bone marrow aspiration smear shows microfilariae of Wuchereria bancrofti. The microfilariae (embryos) are usually found in the blood of infected patients. They have sheathed, transparent body 290 µm in length and 6–7 µm in width. They have a hyaline sheath and central column of nuclei, which do not extend up to the tail.

Q2: What are the causes of pancytopenia?
Pancytopenia is the simultaneous presence of anaemia, leucopenia, and thrombocytopenia. Pancytopenia therefore exists in adults when haemoglobin concentration is less than 135 g/L in males or 115 g/L in females, the leucocyte count is less then 4 × 10^9/L, and platelet count is less than 150 × 10^9/L. Presenting symptoms are usually due to anaemia or thrombocytopenia. Leucopenia is an uncommon cause of the initial presentation in the patients.

Causes of pancytopenia

(A) Pancytopenia with hypoplastic bone marrow
- Acquired aplastic anaemia.
- Inherited aplastic anaemia (Fanconi's anaemia).

(B) Pancytopenia with cellular bone marrow
1. Primary bone marrow diseases
   - Myelodysplastic syndromes.
   - Paroxysmal nocturnal haemoglobinuria.
   - Myelophthisis.
   - Bone marrow lymphoma.
   - Haired cell leukaemia.

2. Secondary to systemic diseases
   - Systemic lupus erythmatosus.
   - Hypersplenism.
   - B12, folate deficiency.
   - Overwhelming infection.
   - Alcohol.
   - Brucellosis.
   - Sarcoidosis.
   - Tuberculosis.
   - Leishmaniasis.

Q3: How will you treat this patient?
The drug of choice for treatment of filariasis is diethylcarbamazine. It is effective in killing microfilariae. The effect of the drug on adult worms is uncertain. The dose of diethylcarbamazine used for treatment of bancroftian filariasis is 6 mg/kg body weight per day orally for 12 days given preferably in divided doses after meals. Diethylcarbamazine may produce severe side effects: (A) those caused by the drug itself—for example, headache, nausea, vomiting, and dizziness. These are observed a few hours after the first dose of diethylcarbamazine and generally do not last for more than three days. (B) Allergic reactions due to destruction of the microfilariae and adult worms—for example, fever, orchitis, lymphadenitis, transient lymph oedema, and...
hydrocele. The local reactions tend to occur later in the course of treatment and last longer. If the drug is given in divided doses, the systemic reaction is much less severe and less frequent after the second dose and rare at subsequent doses. These reactions disappear spontaneously and rarely require interruption of treatment.

Other drugs
Ivermectin—It is a semisynthetic macrolide antibiotic with activity against various nematodes and ectoparasites. It causes a gradual decrease in microfilariae level over 2–4 weeks to 10% or less of pretreatment values. However, these low levels are sustained for at least six months after treatment. Maximum effectiveness is seen at the higher dosage of 200 µg/kg body weight.

Albendazole—400 mg twice daily for 21 days also has macrofilaricidal efficacy.

Discussion
Two types of filarial infection—that is, W bancrofti and Brugia malayi, occur in India. Out of these two, bancroftian filariasis is responsible for 98% of infection. Man is the definitive host and the mosquito the intermediate host of bancroftian and burgian filariasis. The adult worm is found in the lymphatic system, skin, and serous membranes of man. The males are about 40 mm long and females 50–100 mm long. Females give birth to as many as 50,000 microfilariae per day, which find their way into blood circulation via the lymphatic system. The lifespan of microfilariae is not known exactly, but is probably up to a year or more. The adult worms live in the afferent lymphatic or sinuses of lymph nodes for years and causes lymphatic dilatation and thickening of the vessel walls. A lymphatic vessel remains patent as long as the worm remains viable and death of the worm leads to enhanced granulomatous reaction and fibrosis resulting in lymphatic obstruction. The manifestations of filariasis are due to both the direct effects of worms and the immune response of the host to the parasite. Classical disease manifestations can be divided into two distinct clinical types: (A) lymphatic filariasis caused by parasites in the lymphatic system and (B) occult filariasis caused by immune hyper-responsefulness of the human host (for example, tropical pulmonary eosinophilia). Most common presentations of lymphatic filariasis are asymptomatic microfilaraemia, acute adenolymphangitis, and chronic lymphatic disease. The chronic obstructive lesion may present as hydrocele, elephantiasis, and chyluria. Rarely chylous arthritis,² filarial pleural effusion,³ glomerulonephritis,¹ and breast lump⁴ have been described. Our patient manifested the disease as panleucopenia due to the involvement of bone marrow. Until now bone marrow filariasis has not been described. It was possible that liberation of some toxic metabolites by growing larvae—that is, microfilariae, might have caused toxic suppression of the bone marrow. The patient was given diethylcarbamazine and two whole blood transfusions. The patient started improving after a week as panleucopenia due to the involvement of bone marrow. Until now bone marrow filariasis has not been described. It was possible that liberation of some toxic metabolites by growing larvae—that is, microfilariae, might have caused toxic suppression of the bone marrow. The patient was given diethylcarbamazine and two whole blood transfusions. The patient started improving after a week as panleucopenia due to the involvement of bone marrow. Until now bone marrow filariasis has not been described. It was possible that liberation of some toxic metabolites by growing larvae—that is, microfilariae, might have caused toxic suppression of the bone marrow. The patient was given diethylcarbamazine and two whole blood transfusions. The patient started improving after a week as panleucopenia due to the involvement of bone marrow. Until now bone marrow filariasis has not been described. It was possible that liberation of some toxic metabolites by growing larvae—that is, microfilariae, might have caused toxic suppression of the bone marrow.

Final diagnosis
Filarial infection mediated toxic depression of bone marrow.

References

Recurrent painful locking of the elbow joint
Q1: What are the features seen on the radiographs (see p 301)?
The radiographs of the left elbow show multiple radio-opaque loose bodies of variable size.
Q2: What is the likely diagnosis?
The diagnosis is synovial chondromatosis of left elbow.
Q3: What is the line of management?
If the patient is symptomatic, removal of loose bodies and synovectomy by arthroscopy or arthrotyotomy is advocated.

Discussion
Synovial chondromatosis is a synovial proliferative disease in which cartilaginous or osteocartilaginous metaplasia occurs within the synovial membrane. It most commonly involves knee and hip joints, but any joint, bursa, or tendon sheath may be affected.¹ Involved of the elbow joint is very rare. Patients are observed in their second to seventh decades of life, and usually report gradual onset of pain, stiffness, or an enlarging mass around the affected joint. Limitation of motion is a characteristic finding on clinical examination.
There are three phases of the disease:¹
(1) Early with synovial chondrometaplasia but no loose bodies.
(2) Transitional with active synovial disease and loose bodies.
(3) Late with loose bodies but no synovial disease.
Routine roentgenograms may show multiple loose bodies, but especially in the hip, routine films are often normal. Other studies such as arthrography, magnetic resonance imaging, or arthroscopy may be needed.
At surgery multiple loose bodies, both free and attached to the synovium, are visible. Microscopically discrete nodules of disorganised cartilaginous tissue in the synovium, characterised by cellular crowding with cytologic atypia is remarkable. This disordered appearance of primary synovial chondromatosis differentiates it from the more common secondary chondromatosis, which occurs in association with osteoarthritis, traumatic loose bodies, and osteochondritis dissecans. Calcification and endochondral ossification of cartilage nodules may occur.

A verrucous lesion of the palm
Q1: What is your diagnosis?
The diagnosis is cutaneous rhinosporidiosis. The patient gave past history of reddish polyps in the nostrils. He had a reddish friable mass in the nasopharynx and verrucous cutaneous lesions with haemorrhagic spots on top. The possible differential diagnosis is listed in box 1.
Q2: How can you confirm your diagnosis?
Giemsa stained imprint smears taken from the surface of the lesion showing typical sporangia can easily clinch the diagnosis.³ Scrape cytology of the lesion demonstrates typical spherical spores of variable sizes with transparent capsules, and eosinophilic globular bodies (8–10) within the spores in haematoxylin and eosin or Papanicolaou stained smears.³ Fine needle aspiration cytology from the lesion could be an additional diagnostic tool.¹

Causes of multiple loose bodies
- Osteochondritis dissecans.
- Osteoarthritis.
- Synovial chondromatosis.
- Tuberculosis: fibrous or fibroinuse loose bodies.

Treatment is controversial: many advise synovectomy and removal of loose bodies,¹ others prefer simple removal of loose bodies either by arthroscopy or open operation. Recurrence frequently occurs after surgery and this can progress to osteoarthritis. There are rare reports of malignant transformation to chondrosarcoma.

Final diagnosis
Synovial chondromatosis of the left elbow joint.

References

Box 1: Differential diagnosis
- Warts.
- Verrucous tuberculosis.
- Granuloma pyogenicum.
- Donovanosis (genital lesions).
- Condyloma acuminata (genital lesions).
Q3: What is the treatment of this disease?

Surgical excision of the lesion is the preferred treatment. Dapsone and electrodesiccation of the polyp are useful.

Discussion

Rhinosporidiosis is a chronic granulomatous mycosis caused by Rhinosporidium seeberi. The organism has never been isolated in vitro and its taxonomic position is not clear. Organisms have never been isolated in vitro and usually start as friable papillomas that become pedunculated.

Histopathology reveals enormous numbers of mycotic elements in the subepithelial connective tissue. These consist of sharply defined globular thick walled cysts (sporangia) up to 0.5 mm in diameter, which contain numerous rounded endospores, 6–7 μm in diameter. Immature and collapsed sporangia are also present. Occasionally, microabscesses may be formed.

Q4: What is the treatment and prognosis of the condition?

There is no definitive treatment for pulmonary alveolar microliathiasis. Treatment is largely supportive. Bronchopulmonary lavage and corticosteroids have no effect. Although usually asymptomatic at presentation, pulmonary alveolar microliathiasis, on rare occasions, can produce functional abnormalities such as progressive breathlessness, pulmonary hypertension, and cor pulmonale. The prognosis is variable. Many patients remain asymptomatic with stable chest radiographs for several years. When disease does progress, it may do so very slowly. Cases have been reported in which respiratory failure and death ensued after a period as long as 40 years.

Discussion

Pulmonary alveolar microliathiasis is a rare disease of unknown aetiology and is one of the few conditions in which gross radiographic changes are present in the face of minor clinical symptoms. The disease is characterised by the deposition of calcium and phosphorus microliaths (calcspherites) within the alveolar spaces. Most patients are asymptomatic at presentation and incidentally detected to have an abnormal chest radiograph. About 20%–40% of patients may present with respiratory symptoms such as exertional dyspnoea, dry cough, chest pain, or rarely haemoptysis. The physical examination is usually unrevealing at presentation. As the disease progresses, respiratory insufficiency may develop and be associated with cyanosis, clubbing, and evidence of pulmonary hypertension and cor pulmonale. However, pulmonary function remains normal or slightly impaired for a prolonged period after the diagnosis.

No other pulmonary disease has a radiographic pattern as characteristic and diagnostic as that of pulmonary alveolar microliathiasis. The chest radiograph shows sharply defined nodules, predominantly basal and less than 1 mm in diameter. In gross disease, as in our case, the radiographic opacity is so great that the cardiac borders are completely obscured and the heart shadow may “vanish”. Other radiological findings include presence of bullae at the lung apices, a zone of hyperlucency between lung parenchyma and the ribs (black pleura sign), and pleural calcification.
Although the aetiology of this condition is not known, familial occurrence in approximately half of the cases point towards either genetic or environmental factors in the pathogenesis of this condition. A history of occupational or environmental exposure to inorganic dust is usually lacking in these cases. The microliths typically consist of calcium and phosphorus. However, these patients do not have any systemic disturbances of calcium metabolism. It is possible that the disease is a manifestation of abnormal calcium metabolism localised only or predominantly to the lungs.

Final diagnosis
Pulmonary alveolar microlithiasis.

References

Anaemia: an unusual cause

Q1: Describe the features on the barium follow through (see p 303)

The barium meal follow through reveals a 4 cm x 1 cm sausage shaped pedunculated polyp in the distal ileum, which is lying 40–50 cm proximal to the ileocaecal valve.

Q2: What is the differential diagnosis?
The differential diagnosis includes lipoma, inflammatory fibroid polyp, other pedunculated polyps such as those associated with Peutz-Jeghers syndrome and familial adenomatosis polyposis syndrome, and an inverted Meckel’s diverticulum.

Q3: What is the diagnosis?
This patient underwent an exploratory laparotomy, which revealed a Meckel’s diverticulum. A segment of ileum was resected and an end-end anastomosis was performed. The specimen was cut open to reveal an inverted Meckel’s diverticulum.

The histology of the specimen revealed Meckel’s diverticulum with evidence of past ulceration with pyloric gland metaplasia and Paneth cell hyperplasia.

Discussion
Most sources of gastrointestinal blood loss can be diagnosed with upper or lower gastrointestinal endoscopy, but 5% of gastrointestinal bleeding episodes are occult and caused by a variety of lesions within the jejunum or ileum. We present a rare case of chronic gastrointestinal bleeding caused by an inverted Meckel’s diverticulum.

Meckel’s diverticulum is the most common congenital abnormality of the small intestine, seen in 0.3%–3% of the population at necropsy. It results from the persistence of the omphalomesenteric (vitelline) duct, which is an embryonic connection between the mid gut and the umbilical cord. It arises from the antimesenteric border of the ileum, and contains all layers of the intestinal wall, has its own mesentery, and derives its blood supply from a terminal branch of the superior mesenteric artery.

Painless, often haemodynamically significant, but usually not life threatening, lower intestinal bleeding is a common presentation. Bleeding is more common in children and occurs at a mean age of 5 years. Haemorrhage typically results from ulceration within the diverticulum or adjacent intestinal mucosa as a consequence of acid secretion from ectopic gastric mucosa. There is a debate about the prevalence of Meckel’s diverticulum in males versus females, however complications occur more frequently in males.

Intestinal obstruction due to Meckel’s diverticulum is more common in older patients and can be caused by intussusception, volvulus, herniation, or entrapment of bowel through a defect in the diverticular mesentery. Symptoms mimicking acute appendicitis can occur as a result of Meckel’s diverticulitis, H pylori infection of the ectopic gastric mucosa, or a foreign body in the diverticular lumen.

On barium examination an inverted Meckel’s diverticulum is seen as a solitary elongated club shaped mass (with or without intussusception) in the distal ileum. If intussusception occurs, ultrasound demonstrates a target sign with alternating layers of different attenuation with a low attenuation centre. It is important to be aware of the radiological features of inverted Meckel’s diverticulum, as surgical removal of these lesions is warranted in most cases.

The appearances of an inverted Meckel’s diverticulum on barium examination are shown. It is important to recognise the abnormality so that resection can be performed to avoid the serious complications of intussusception and bleeding.

Final diagnosis
Meckel’s diverticulum.

References