CASE REPORT

Roth's spots: an unusual presentation of HIV

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A 46 year old Nigerian man presented with a four week history of progressive bilateral visual loss. He had been unwell, with weight loss, fever, and night sweats for six months. Dilated funduscopy revealed macular haemorrhages and diffuse Roth's spots. The patient was found to be severely anaemic and a bone marrow aspirate revealed a T cell lymphoma with a decreased CD4+ T cell count. The patient consented for testing for HIV which proved positive.

Roth's spots do not usually involve the macula.^{1,2} In his original paper in 1872 Moritz Roth reported a series of patients with septicaemia and included descriptions of small white spots and separate foci of haemorrhages in the retina, which he termed *retinitis septica*.^{3,4} Roth assumed these lesions to be disseminated foci of the infective process. Six years later Litten described "white centred haemorrhages" in association with bacterial endocarditis and coined the term Roth spot.¹

CASE REPORT

A 46 year old Nigerian man presented with a four week history of progressive bilateral visual loss. He also reported malaise, fever, anorexia and night sweats, and had lost 14 kg in weight. He denied any history of exposure to HIV related risk factors.

Visual acuities at presentation were 6/36 in each eye with quiet anterior segments. Dilated funduscopy revealed multiple white centred haemorrhages (Roth's spots) and large premacular haemorrhages (fig 1). There was no associated vitritis or retinitis/vasculitis. Physical examination revealed a grade III pansystolic murmur, hepatosplenomegaly, cervical and axillary lymphadenopathy, and borderline pyrexia of 37.7°C. There were no splinter haemorrhages or nail bed infarcts.

Primary haematological investigations revealed a gross microcytic anaemia (haemoglobin 52 g/l). White cell and

Figure 1 Multiple Roth's spots and large premacular haemorrhages.

Figure 2 Resolving premacular and diffuse haemorrhages.

platelet counts were normal. Erythrocyte sedimentation rate and C-reactive protein were grossly raised at 120 mm/hour and 148 mg/l respectively. A presumptive diagnosis of subacute bacterial endocarditis was made, although routine and transoesophageal echocardiography were negative. Blood cultures were negative. The possibility of a myeloproliferative disorder was considered. The patient was started on empirical intravenous antibiotic therapy and underwent immediate transfusion of four units of whole blood. A bone marrow aspirate showed a T cell lymphoma with anaplastic T cells.

His coagulation profile revealed an international normalised ratio of 1.23. Haematinics were normal with the exception of a grossly raised serum ferritin of 3668 µg/l. Screening for opportunistic pathogens was negative.

On review one week later, the Roth's spots had decreased in number and the macular haemorrhages had begun to resolve (fig 2).

A CD4+ T cell count revealed a lymphopenia of 70 cells/mm³. A liver biopsy specimen revealed the presence of Kupfer cells. Retrospectively, these were indicators of the presence of *Mycobacterium avium intracellulare* complex. The patient consented to testing for HIV and this proved positive.

On review two months later, the macular haemorrhages had completely resolved, with no macular hole formation (see later). Unfortunately the patient was too ill for further fundus photography as he was undergoing treatment for his refractile anaemia and the *Mycobacterium avium intracellulare* complex. His CD4+ T cell count had fallen to 4 cells/mm³.

DISCUSSION

Histologically, Roth's spots consist of haemorrhage, presumably from a ruptured capillary network, and fibrin thrombus with platelet aggregates.^{5,6} Although initially thought of as a manifestation of subacute bacterial endocarditis, Roth's spots are a non-specific sign seen in patients with blood dyscrasias and anaemia. They should not be confused with haemorrhages associated with cotton wool spots. The latter are sentinels of retinal ischaemia seen as result of obstruction of axoplasmic flow in the nerve fibre layer.⁷ There are many

Box 1: Conditions in which retinal haemorrhages occur with cotton wool spots

- Diabetic retinopathy.
- Hypertensive retinopathy.
- Retinal vein occlusion.
- Vasculitides.
- Pre-eclampsia (including Hellp syndrome).
- Asphyxia (including prolonged intubation).
- Ocular ischaemic syndrome.

conditions which can give rise to retinal haemorrhages and cotton wool spots (see box 1) including HIV retinopathy.⁸

Roth's spots resolve with treatment of the underlying infective or coagulative disorder. Visually they are asymptomatic unless the macula is involved.^{9–10} The presenting symptom in this patient was visual loss from macular haemorrhage.

The multiple diffuse Roth's spots were secondary to AIDS related anaemia. Macular lesions are rare. Patients may be asymptomatic in the presence of extensive retinopathy unless the macula is involved. Even extensive macular lesions usually recover with correction of haematological indices and eradication of infection. Few may develop macular holes.¹ The chance of an individual with AIDS developing an ocular complication is high.

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Box 2: Learning points for Roth's spots

- They are a non-specific sign.
- They usually occur in severe anaemia/blood dyscrasias or subacute bacterial endocarditis.
- Histologically they consist of platelet and fibrin thrombus in the centre of a ruptured capillary network, and represent an active retinal reparative pathology.
- They can be seen in shaken baby syndrome.
- They may be mistaken for cotton wool spots and associated retinal haemorrhage.
- They are visually asymptomatic unless the macula is (rarely) involved.
- Visual prognosis is good with the treatment of the underlying disorder.

REFERENCES

- 1 Beatty S, Harrison RJ, Roche P. Bilateral holes resulting from septic embolization. *Am J Ophthalmol* 1997;**123**:557–9.
- 2 Silverberg HH. Roth spots. *Mt Sinai J Med* 1970;**37**:77–9.
- 3 Roth M. Über Netzhautaffektionen bei wundfiebern [Retinal manifestations of wound fever]. *Deutsch A Chir* 1872;**1**:471–84.
- 4 Roth M. Beiträge zur Kenntnis der varicosen hypertrophie der nervenfaseren [Contributions to the knowledge of varicose hypertrophy of nerve fibres]. *Virchow's Arch Pathol Anat* 1872;**55**:197–217.
- 5 Von Barsewisch B. *Perinatal retinal haemorrhages*. New York: Springer-Verlag, 1979: 51–2.
- 6 Ling R, James B. White centred retinal haemorrhages (Roth spots). *Postgrad Med J* 1998;**74**:581–2.
- 7 McLeod D. Reappraisal of the retinal cotton wool spot: a discussion paper. *J R Soc Med* 1981;**74**:682–6.
- 8 Newsome DA, Green WR, Miller ED, et al. Microvascular aspects of aids. *Am J Ophthalmol* 1984;**98**:590–601.
- 9 Meyers SM. The incidence of fundus lesions in septicaemia. *Am J Ophthalmol* 1979;**88**:661–7.
- 10 Neudorfer M, Barnea Y, Geyer O, et al. Retinal lesions in septicaemia. *Am J Ophthalmol* 1993;**116**:728–34.