A CASE REPORT ON CORONARY ARTERY ANEURYSM IN INFANCY

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SYNOPSIS

This is a case report of a six month old Chinese male infant with clinical features not quite typical of the Japanese mucocutaneous lymph node syndrome. The histological pattern of the arteritis and its distribution suggests very strongly that this is a case of mucocutaneous lymph node syndrome.

INTRODUCTION

Mucocutaneous lymph node syndrome is an accepted clinical entity affecting infants and young children. It was first described by Kawasaki in Japan in 1967 and subsequently recognised and described by others in North America and Europe. Here we describe a case which is a forms fruste variety of mucocutaneous lymph node syndrome.

CASE REPORT

The patient was a six month old male Chinese infant who had fever and cough for 3 days, a rash for 2 days and mild diarrhoea for 1 day. At the onset of illness, he had been seen by a general practitioner who gave him an antipyretic, an antihistamine and ampicillin. The following day a rash broke out starting from the face and spreading to the rest of the body.

There was no significant past history of note.

Clinically he was febrile and fretful. Heart rate was 120/min, regular. The lungs were clear; liver 2 cm, spleen 1 cm. The throat was injected. No lymphadenopathy was noted. Neurologically he was normal. An erythematous papular rash was present on the face, around the mouth, on the trunk and proximal part of the limb.

The provisional diagnosis was an upper respiratory tract infection with drug allergy.

He was treated symptomatically with paracetamol and promethazine.

Preliminary investigations: Hb 11.7G%, TW 21,700(p 71% L 24%, M 3%, E 2%). Urine FEME - normal.

In view of the leucocytosis, the high fever, an injected throat and the possibility of sensitivity to Ampicillin he was started on Erythromycin.

Initially he appeared to improve but on the 6th hospital day his temperature started to swing again. No abnormal clinical findings were detected till the 10th hospital day when a mass was noted in the right iliac fossa. This was 2.5 cm in diameter, slight

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mobile, non-tender. The abdomen was soft, liver 3 cm, spleen just palpable. Rectal examination showed no abnormalities.

Investigations at this point were:-

Hb 11.2 g%

TW 41,600

ESR 103 mm

Urine FEME normal

Urine c/s negative

CSF c/s negative

Blood culture - 1st specimen : no growth
- 2nd specimen : Micrococcus

Stools c/s - negative

Ba enema - normal

IVP normal

The surgical opinion was that this was a mass of enlarged mesenteric nodes from a pyogenic infection in the abdomen. He was given gentamycin and flagyl.

On day 11 he was noted to have transient cyanotic attacks during crying. This was confined to the fingers which were warm and slightly blue. There was no central cyanosis. The CVS was normal. These attacks recurred each time associated with crying. On Day 11 he became more toxic and his temperature rose to 39.6°C. He had peripheral cyanosis in all 4 limbs. Apart from the abdominal mass there were no other significant findings.

Repeat investigations:-

Hb 10.4G% TW 46,000 P 86% L 11% M 3%

Platelets 615,000 Urea 15 mg%

S. Na 136 mmol/l, K 4.9 mmol/l Cl

In view of his clinical state and the failure to respond to conservative treatment an exploratory laparotomy was done. At operation serous exudate was present in the peritoneal cavity and grossly enlarged mesenteric nodes were found. The Appendix was inflamed with peri-appendiceal fibrosis. The rest of the abdominal viscera was normal. An appendicectomy was done. Culture of the peritoneal fluid grew E. Coli.

Post-operatively he continued to have a swinging temperature but the general condition was steady. In the early hours of the 3rd post-operative day he collapsed and did not respond to resuscitation.

At post mortem the main findings were limited to the cardiovascular system. The heart weighed 40 gms and was normal in size. An area of fresh infarction was present in the myocardium at the anterior septal region measuring about 1.0 cm in diameter. Both coronary ostia were normal. However, the proximal two-thirds of the anterior descending branch of the left coronary was grossly dilated and tortuous. On opening the vessels, the lumen was found to be occluded by a laminated thrombus (figure 1). The other coronary arteries were grossly normal. All the valves and major vessels of the heart were normal.

At the gastro-intestinal system an appendicectomy had been recently performed and the stump was noted

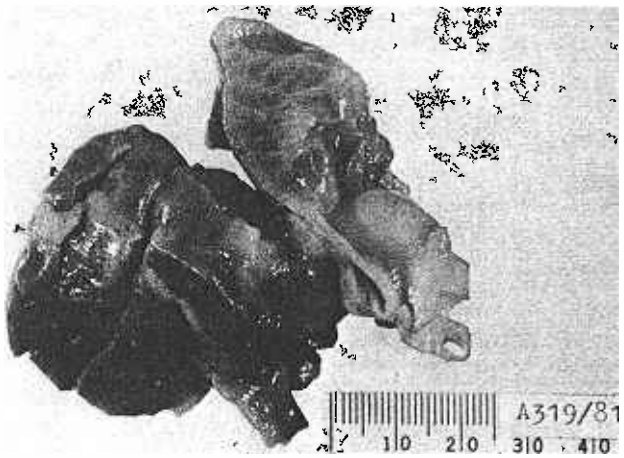

Figure 1: Gross view of the anterior surface of the heart with the coronary aneurysm opened. Note the thrombus present in the lumen.

to be satisfactory. Multiple enlarged mesenteric lymph nodes ranging from 1.0 cm to 1.5 cm in diameter were also present. All other organ systems examined were essentially normal.

MICROSCOPIC FINDINGS:

Heart - Histology of the myocardium confirmed the presence of a recent infarction less than 24 hours old (Fig. 2).

Coronary arteries - Histology of the anterior descending branch showed the presence of an arteritis with severe destruction of the entire arterial wall and disruption of both the internal and external elastic laminae. The infiltrate consisted of both mononuclear cells with polymorphonucleocytes. The lumen was grossly dilated and filled with thrombus (Figure 3). Histological examination of the other grossly normal main coronary arteries also showed involvement:- by a similar panvascular arteritis (Figure 4 & 5). The proximal portion of the right coronary artery also showed the presence of early thrombosis within its lumen. Multiple sections were stained with Martius Scarlet Blue and also occasional small deposits of fibrin were inconsistently detected. Fibrinoid necrosis was therefore not a prominent feature.

Mesenteric lymph nodes - Sections showed a reactive follicular hyperplasia with one vessel showing a focal area of intimal thickening. The elastic laminae were intact.

Histological examination of the arteries within the heart, lungs, kidneys, spleen and brain did not show any involvement by arteritis. Other than the coronary

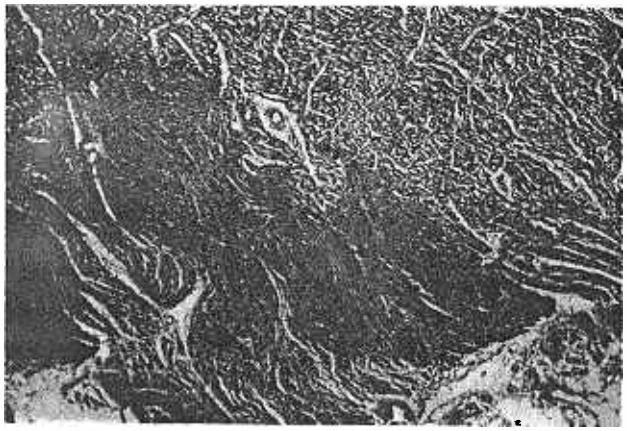

Figure 2: Microscopic section of the heart showing the area of recent infarction (Haematoxylin and Eosin stain x 40).

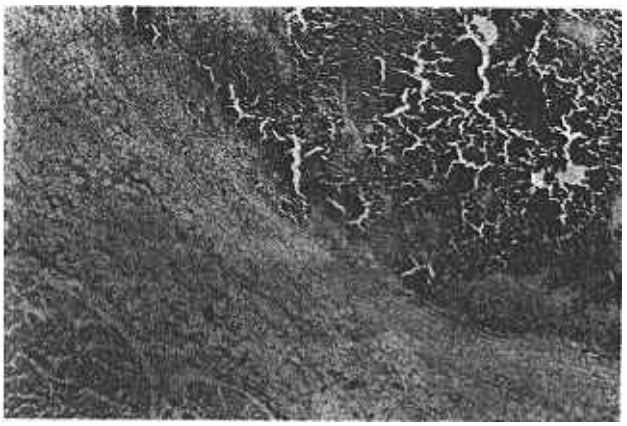

Figure 3: Microscopic section of the coronary aneurysm showing the severe destruction of the arterial wall with the dilated lumen filled with thrombus. (Haematoxylin and Eosin stain x 40).

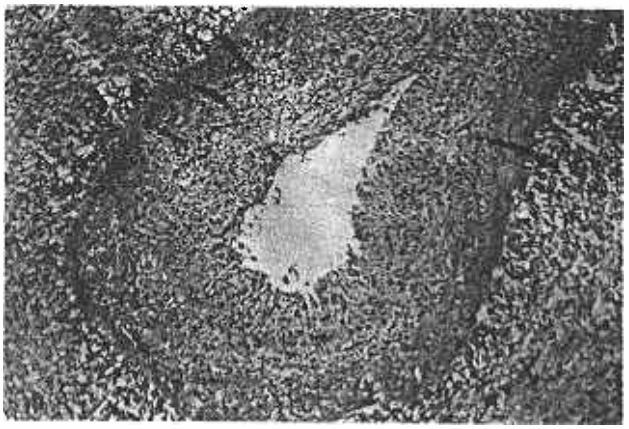

Figure 4: Microscopic section of the grossly normal right coronary artery showing involvement by a panvascular arteritis with intimal proliferation and thickening (Haematoxylin and Eosin stain x 100).

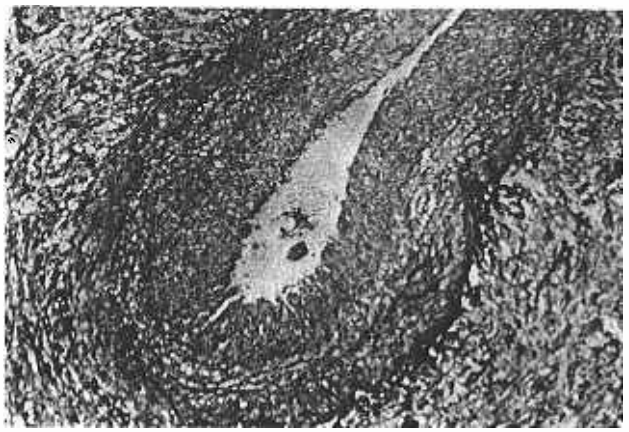

Figure 5: Microscopic section of the same arterial segment as in Figure 4 showing disruption of both the internal and external elastic laminae (Weigert Elastic stain x 100).

and mesenteric arteritis, other larger sized arteries external to the organs were not examined.

The appendix removed prior to death showed an acute or chornic inflammation involving mainly the muscularis propria and the serosal surface.

CAUSE OF DEATH:

Death was due to an acute myocardial infarction resulting from a coronary thrombosis in a coronary artery aneurysm. The aetiology of the aneurysm was that of an arteritis that had extensively involved the main coronary arterial tree.

DISCUSSION

Coronary artery aneurysm may occur as a primary congenital abnormality or as a secondary manifestation of coronary artery fistula. It could also be acquired following a mycotic or spirochaetal infection or from trauma be it accidental or surgical. Dissecting aneurysms of the coronary arteries usually affecting the left one occur in older individuals with atherosclerosis and in Marfan's syndrome. Arteritis is another important cause. The ones which cause coronary artery aneurysms are infantile polyarteritis nodosa (IPN)/Mucocutaneous lymph node syndrome (MCLS) or Kawasaki's disease as named after the person who first described these cases; and classical polyarteritis nodosa (1, 2, 3). The other arteritis e.g. Takayashu and gaint cell arteritis in children are associated with aneurysms in the aorta and other systemic arteries but coronary artery aneurysms have yet to be reported in these conditions (1).

Clinical polyarteritis nodosa (CPN) occur in the older child. It is a vasculitis affecting the small to medium sized vessels (4). Clinically it produces a more protracted acute phase illness; the rash is petechiael or purpuric; often severe nephritic signs with renal insufficiency is present when renal arteries are affected. If coronaries are affected it involves medium to small vessels rather than the main one. The arteritis also occurs in the skeletal muscle and in the skin and this is more typical of CPN than IPN/MCLS (5). Histologically there is more extensive fibrinoid necrosis of vessel walls.

MCLS was first described by Dr T Kawasaki in 1967

(6). This disease is more prevalent in infancy, peak age is eighteen months with a steady decline to 10 years. The male/female ratio is 1.5/1. Sudden deaths occur in 1-2% of children during the 3rd and 4th week of illness; death is usually from carditis, arrhythmia or myocardial infarct. It is a clinical syndrome comprising of a high fever of more than 5 day's duration, bilateral conjunctival injection, redness of the oropharynx with fissuring of the lips and a "strawberry" tongue, oedema of the extremities with reddening of the palms and soles followed by desquamation of the finger tips, a polymorphous rash of the thumb and a non-suppurative cervical lymphadenopathy of at least 1.5 cm in diameter (7, 3). From the diagnostic guidelines laid down by the Japan MCLS Research Committee, at least 5 of these items should be satisfied for the diagnosis. Associated features include diarrhoea, vomiting, arthralgia, aseptic meningitis, icterus and carditis. There is a leucocytosis, high ESR, a thrombocytosis and a negative ASOT.

Landing and Larson compared patients from North America with IPN and coronary artery involvement with clinically validated MCLS from Hawaii and Japan (4). They found that clinically and pathologically these two conditions were similar and there was no reason to distinguish them into 2 separate entities. This is the current consensus of opinion.

The basic pathology in these 2 conditions is a vasculitis affecting the medium to large vessels, typically vessels not in the parenchyma of involved organs e.g. heart, kidney, adrenal (4). Vessels of skin and muscles are not affected (8). Hence the lack of support from a skin or muscle biopsy. There is periarterial inflammation, necrosis and destruction of the media and intimal inflammation with little or no fibrinoid change as contrast to CPN. As a result of the destruction to the media and intima, dilatation and thrombosis of the affected vessels occur.

Diagnosis of MCLS remains a clinical one as there are no pathognomonic laboratory features (5). Those with a fully developed syndrome is distinct but formes fruste will be extremely difficult to diagnose.

This patient was atypical. The rash was present on the face and trunk. There was no redness and oedema of the palms and soles which lead to desquamation of the skin. This occurs in 90 - 95% of the Japanese cases. Conjunctival congestion was absent. Instead of cervical lymphadenopathy (one of the main principle symptoms) he had mesenteric lymphadenopathy. Very rarely Raynaud's phenomenon occur (9). In one case gangrene of a limb occurred as a result of an aneurysm and arteritis in the brachial artery (8).

The post-mortem findings of coronary aneurysm with acute myocardial infarction and the histological picture of an arteritis extensively involving the main coronary arteries are consistent with the pathological features found in Kawasaki's disease. However, the lack of a pathological arterial survey in this case prevents us from commenting on the systemic arterial involvement which is seen in this condition. Nevertheless, this diagnosis is strongly suggested by the particular involvement of the coronary arteries by arteritis and aneurysm, a feature most commonly seen in this disease.

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