An unexpected finding during gastroscopy

Introduction

Insertion of a pacemaker is the treatment of choice in children with complete heart block (Hurst et al, 1990). Migration of the pacemaker generator into the stomach (Isobe et al, 2000), peritoneum (Salim et al, 1999), caecum (Holings, 1965), urinary bladder (Baumgartner et al, 1990) and jejunum (Zimmermann et al, 1985) have previously been reported.

The authors report a 23-year-old woman whose redundant abdominal pulse generator migrated into the stomach resulting in multiple liver abscesses and gastric ulceration.

Discussion

Permanent cardiac pacing is indicated in all symptomatic and in some asymptomatic cases with congenital atrioventricular block (Baumgartner et al, 1990).

Transmediastinal and epicardial pacing systems were the standard practice in cardiac pacing 20–30 years ago. Nowadays, most pacemakers are placed transvenously and are sited endocardially. It was also considered safe to leave the redundant epicardial leads in situ as removal of uninfected epicardial lead system is a difficult, arduous task and may be dangerous especially at the level of the heart, but abandonment of the pulse generator has never been recommended.

This case highlights that the risks from such abandonment remain constant over a prolonged period. Migration of pacemaker devices is well recognized in other situations and the long-term complications include sepsis, obstruction, haemorrhage and perforation (Holings, 1965; Siclari et al, 1986; Salim et al, 1999; Isobe et al, 2000; Lewis, 2000). Hepatic abscesses most commonly occur following infection of the biliary tree (Cushieri et al, 1995). Untreated pyogenic liver abscesses carry a high mortality and as many as 10% are diagnosed at post-mortem. Principal treatment involves aspiration and administration of appropriate antibiotics.

Migration of the redundant system into the stomach resulted in pressure necrosis and ulceration of the gastric mucosa producing significant haemorrhage in this patient. Haematogenous bacterial spread to the liver resulted in miliary abscess formation. These serious morbidities have not previously been described. It is suggested that at the time of system replacement, consideration is given to the removal of the redundant generator. This may be particularly relevant when the original system was implanted in childhood and subsequent growth may have altered the generator position and its relationship to adjacent tissues.

Figure 1. Chest X-ray showing the new and old pulse generators in-situ. The old system can be seen below the diaphragm in the stomach air shadow (arrow).

Figure 2. Pulse generator seen in the stomach at gastroscopy.

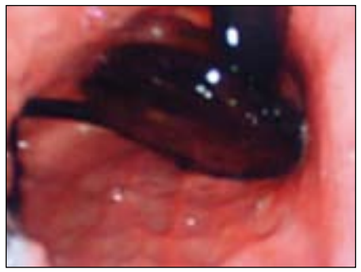

Figure 3. Computed tomography scan showing pulse generator system in the stomach and liver abscesses (arrow).

Case Report

At the age of 3 years, the patient had undergone surgery for repair of an atrial septal defect and had an epicardial pacing system placed for congenital atrioventricular block. This was replaced with an endocardial dual chamber pacemaker at the age of 15 years. The epicardial pulse generator and leads were left in situ.

Now aged 23 years old, the patient presented with a 48-hour history of right shoulder tip pain, palpitations, rigors and subsequent melaena. On examination she was pyrexic (40°C) with vague upper abdominal tenderness. She had no overt features of bacterial endocarditis. Her chest X-ray shows both the endocardial and epicardial pacing system in situ (*Figure 1*). Preliminary haematological investigations revealed a microcytic hypochromic anaemia (7.4 g/dl), neutrophilia (25x10^9/ml), an erythrocyte sedimentation rate of 121 mm/hr and a C-reactive protein of 272 mg/litre. Repeated blood cultures were negative. Transoesophageal echocardiography showed no evidence of valvular or pacemaker lead vegetations. Gastroscopy revealed the redundant epicardial pacemaker generator inside the stomach with evidence of gastric ulceration (*Figure 2*).

After initial resuscitation with blood products and parenteral antibiotics she underwent surgery where through a gastrostomy the pulse generator was retrieved. At laparotomy the left lobe of the liver appeared unhealthy and subsequent computed tomography scan of the abdomen confirmed the presence of multiple intrahepatic abscesses (*Figure 3*). It was decided that the hepatic abscess were not suitable for percutaneous drainage as they were multiple and predominantly in the left lobe of the liver. She continued on a protracted course of intravenous antibiotics and made a full recovery thereafter.

Conclusions

Redundant epicardial pulse generator left in situ can pose serious complications and potentially life-threatening consequences. This case illustrates migration of the redundant epicardial pulse generator into the stomach and secondary liver abscesses which has never been reported before. BJHM

Dr M Shafie Kamaruddin *is Cardiology Registrar in the Department of Cardiology and* **Mr M Subramanian Ramachandran** *is Surgical Senior House Officer in the Department of Surgery, Royal Victoria Hospital, Belfast,* **Dr Graham B Turner** *is Gastroenterology Registrar in the Department of Medicine, Ulster Hospital, Dundonald,* **Mr Mohammed Yousaf** *is Surgical Registrar in the Department of Surgery,* **Dr Paul McConville** *is Cardiology Junior House Officer in the Department of Cardiology,* **Dr Carol Wilson** *is Consultant Cardiologist in the Department of Cardiology and* **Mr W Barry Clements** *is Consultant Surgeon in the Department of Surgery, Royal Victoria Hospital, Belfast*

Correspondence to: Dr MS Ramachandran, Senior House Officer, Department of Neurosurgery, Wessex Neurological Centre, Southampton General Hospital, Southampton SO16 6YD

Baumgartner G, Nesser HJ, Jurkovic K (1990) Unusual cause of dysuria: migration of a pacemaker generator into the urinary bladder. *PACE* **13:** 703–4

Cushieri A, Giles GR, Moosa AR (1995) *Essential Surgical Practice.* 3rd edn. Butterworth Heinemann, London: 1152–3

Holings RM (1965) Spontaneous perforation of the caecum and a cardiac pacemaker. *Aust NZ J Surg* **35:** 136–40

Hurst JW, Schlant RC, Rackley CE (1990) *The Heart: Arteries and Veins.* 7th edn. McGraw Hill, New York: 563

Isobe F, Kosakai Y, Ono Y, Aragaki Y, Kamiya T (2000) Intragastric migration of a pacemaker implanted in the pleural space. *Jpn J Thorac Cardiovasc Surg* **48**(8): 528–30

Lewis WR (2000) Protrusion of an active fixation pacing lead into the abdominal cavity. *J Cardiovasc Electrophysiol* **11:** 944

Salim MA, DiSessa TG, Watson DC (1999) The wandering pacemaker: intraperitoneal migration of an epicardially placed pacemaker and femoral nerve stimulation. *Pediatric Cardiol* **20**(2): 164–6

Siclari F, Uhlschmid G, Zwicky P, Turina M (1986) Intracolonic migration of a pacemaker generator. *Thorac Cardiovasc Surgeon* **34:** 338–9

Zimmermann G, Hoffmann B, Eggert WD (1985) Penetration of a pacemaker into the jejunum following conservative treatment of a pocket infection. *Zbl Chirurgio* **110:** 1156–7