Low molecular weight heparin and the risk of haemorrhage following percutaneous biopsy, despite a normal standard clotting screen

C. Cook
M. Callaway

Received: 16 November 2000
Revised: 30 January 2001
Accepted: 6 February 2001
Published online: 16 May 2001
© Springer-Verlag 2001

Abstract There has been an increase of the use of low molecular weight heparin in the treatment of thrombotic events. This case report describes a complication of a pelvic mass biopsy performed whilst the patient was being treated with low molecular weight heparin (LMWH). Despite an uncomplicated biopsy procedure and confirmation of normal clotting screen, INR (International normalised ratio), APTR (Activated partial thromboplastin ratio) and platelet levels, the biopsy was complicated by severe haemorrhage.

Keywords Biopsy · Haematoma · Pelvic mass

Introduction

A patient underwent pelvic mass biopsy while being treated with low molecular weight heparin (LMWH). Despite an uncomplicated biopsy procedure and confirmation of normal clotting screen, international normalised ratio (INR), activated partial thromboplastin ratio (APTR) and platelet levels, the biopsy was complicated by severe haemorrhage.

Case report

A 69-year-old woman was admitted with a short history of thigh swelling. The patient had a history of both ovarian and breast carcinoma. The patient had been in remission from both conditions for 5 years. Both conditions had been treated successfully by combined oophorectomy and hysterectomy, and lumpectomy, respectively.

A femoral and iliac venogram confirmed extensive thrombus within the external iliac vein. However, due to the previous surgery, and the site of the thrombus, a pelvic ultrasound scan was performed to exclude any underlying cause. The ultrasound demonstrated bilateral hydronephrosis and a pelvic mass of uncertain aetiology. A subsequent MR scan confirmed a large posterior mass within the left hemipelvis, but it was unclear whether this represented a new primary or even recurrent metastatic ovarian or breast carcinoma. Intravenous Gadodiamide (Omniscan, Nycomed, Princeton, N.J.) was used, but no enhancement of the lesion was demonstrated.

In view of the implications of the diagnosis of further treatment, a percutaneous biopsy was indicated. The patient was being treated for the proximal thrombosis with a subcutaneous injection of low molecular weight heparin and enoxaparin at a therapeutic dose of 1 mg/kg (Clexane, Rhone-Poulenc Rorer). There were no contraindications to this, although the renal function was just above the normal range: urea 6.7 mmol/l (normal 3–7 mmol/l) and creatinine 113 μmol/l (normal 60–100 μmol/l). The subcutaneous injection of enoxaparin on the morning of the biopsy was omitted, the last dose being administered at 18:00 on the previous day; thus, there had been 20 h between the last administration of enoxaparin and the biopsy. In addition, an anticoagulation screen was performed. This conventional screen was normal: INR (1.0); APTR (1.06); and platelet count (334; normal 150–400 x 10^9). The biopsy was performed under MR guidance. A standard transgluteal route was chosen avoiding any visualised vascular structures (Fig. 1). An 18-G MR-compatible cutting needle was used (Daum). Two passes into the mass were made with no indication of any immediate complication (Fig. 2). Histology confirmed recurrent endometrioid ovarian carcinoma with no hypervascular element.

However, 4 h post-procedure, the patient became hypotensive and tachycardic requiring fluid resuscitation. Over the next 36 h the patient’s haemoglobin dropped from 11.6 to 8.0 g/dl (normal 11.5–15.5 g/dl). A repeat MR scan of the pelvis and upper thighs
showed extensive intramuscular haematoma in the left gluteal muscles, extending down the posterior aspect of the thigh. The patient recovered with no further complications.

**Discussion**

Percutaneous biopsy under image guidance remains a safe procedure, allowing a tissue sample to be obtained for histological examination with minimal patient intervention [1]. Often in complex cases a core of tissue is required for pathological analysis, and this necessitates the use of a cutting needle. Most centres would perform a standard clotting screen prior to the use of an 18-G needle. Recent recommendations of the British Society of Gastroenterology [2] pre-liver biopsy only indicates the use of standard clotting studies.

The use of low molecular weight heparin (LMWH) continues to increase, particularly in the prevention and treatment of thrombo-embolic disease because of the ease of a once daily subcutaneous injection. Low molecular weight heparin acts in preventing thromboembolism by potentiating the inhibition of coagulation factor Xa, and anti-thrombin activity [3]. Some LMWH also exhibit anti-IIa activity [4]. The degree of activity may depend on renal function, as measured by creatinine clearance, as well as other less tangible variables such as the age and “patient” or “healthy” population subgroups [5]. Our local guidelines suggest caution if the serum creatinine level is over 150 μmol/l, but the level was well below this in this case.

Despite the widespread use of LMWHs, they are still known to exhibit several side effects, and most importantly, severe haemorrhagic complications have been documented [6]. Accordingly, a variety of different assays of anti-Xa activity have been developed in order to monitor the degree of anticoagulation achieved. However, there is considerable inter-assay variability, and thus the type of assay and the patient subgroup, as well as the dose of LMWH, must be taken into account in their interpretation [6]. The most recent pharmacological guideline (British National Formulary September 1999) indicates no need for monitoring in prophylactic treatment with LMWH, and does not suggest that monitoring is necessary in therapeutic doses. Enoxaparin, in particular, has a peak activity at 3–5 h, with a half-life of 4–5 h, and the duration of therapeutic effect is up