Short note

Predicting complete removal of impalpable breast carcinomas using stereotactic radiologically guided surgery

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Introduction

The stereotactic ABBI® (Advanced Breast Biopsy Instrumentation; USSC, Norwalk, CT, USA) breast biopsy system allows the excision of suspicious, impalpable, breast lesions under local anaesthesia using a disposable cannula of up to 2·2 cm in diameter. Many of the excised lesions do not reach the surgical margins. A retrospective pilot study suggested that at reoperation most breasts were tumour-free, so reoperation may have been unnecessary. If it were possible to predict from an ABBI biopsy specimen which small breast cancers could be removed, then further surgery could be limited to a minimally invasive procedure for the assessment of the axillary status.

This study examined all breast carcinomas diagnosed using the ABBI procedure that were subsequently treated with surgery at this centre. The main objective was to see if there was a way to predict the complete absence of tumour in the remaining breast that might make reoperation unnecessary.

Patients and methods

Between January 1998 and December 2003, 406 ABBI biopsies of non-palpable, radiologically suspicious breast lesions were performed at the Tejerina Foundation, Madrid, Spain. The largest available cannula was used: 2·0 cm increasing to 2·2 cm (*Fig. 1*) after September 2003 in all but 16 instances, where a 1·5-cm cannula was employed. All procedures were carried out under local anaesthesia as a day case.

The non-palpable breast lesion was a circumscribed microcalcification cluster in 65 per cent of instances, a nodule in 26 per cent and areas of breast distortion in the remainder (9 per cent). All target lesions were excised on the first attempt.

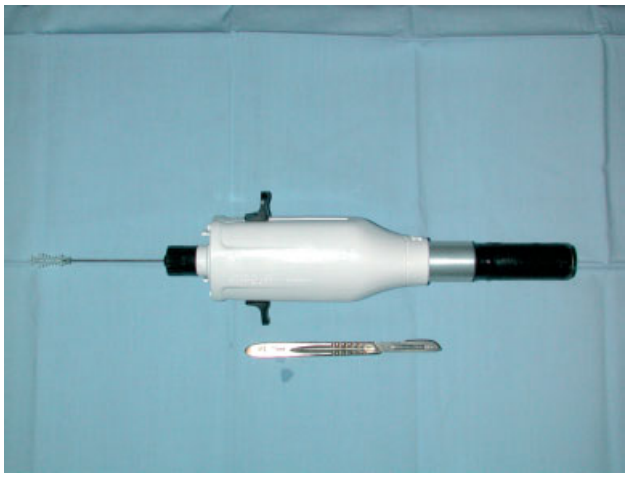

Fig. 1 An ABBI® (Advanced Breast Biopsy Instrumentation) 2·2-cm cannula

The operative specimen was included *en bloc* in paraffin in order to assess the margin status microscopically.

Results

There were few complications: eight postoperative bruises and two deep haematomas not requiring reoperation; one patient had a vasovagal reaction, and one experienced acute pain as the local anaesthetic was injected, although none during the biopsy.

Of 406 ABBI biopsies, 102 (25·1 per cent) contained carcinoma (52 *in situ*, 50 invasive). On microscopic examination, 28 of the 52 *in situ* carcinomas had involved margins compared with 21 of 50 invasive cancers ($P = 0{\cdot}24$, Fisher's exact test). Seventy-one of the 102 women with a carcinoma (40 invasive, 31 *in situ* tumours) had a repeat excision at the authors' centre, while the rest had been referred from elsewhere simply for diagnostic biopsy.

In the group with invasive carcinomas, the initial biopsy margins were tumour-free in 25 patients and involved in the remaining 15. On re-excision, only two of the group with tumour-free margins had residual tumour in the surrounding breast compared with 11 of the 15 with involved margins ($P < 0{\cdot}001$). The presence of axillary nodal metastases was unrelated to biopsy margin involvement or to the presence of residual tumour on reoperation.

In the group with *in situ* carcinomas, the initial biopsy margins were tumour-free in 12 patients and involved in the remaining 19. On re-excision, two of the group with tumour-free margins had involvement of the surrounding breast compared with 15 of the 19 with affected biopsy

margins ($P = 0{\cdot}001$). In this group, the residual tumour was unexpectedly invasive in two women.

Discussion

The value of the ABBI system as an alternative to open surgery has been questioned. The lesion cannot always be removed successfully[1], and the biopsy margins are often affected[2]. However, with growing experience and improving case selection, these drawbacks have largely been overcome[3,4]. The most suitable lesions are either nodules or very well circumscribed clusters of microcalcification less than 15 mm in diameter.

The question addressed in this report has been examined before[4,5]. Lifrange *et al.*[4] found that involvement of breast tissue around a lesion was inversely related to tumour size[4]. Watermann *et al.*[5], on the other hand, found that all patients with ductal carcinoma *in situ* had residual cancer, even those with clear margins of the ABBI specimen[5]. The conclusions of the present study differed from a larger series: the only factor that could significantly predict the presence of residual tumour in the remaining breast after ABBI biopsy was the involvement of the biopsy margins. This was irrespective of the original tumour size or whether it was invasive or *in situ*. Furthermore, tumour size, margin involvement and the presence of residual tumour all failed to predict the presence of axillary metastasis.

Residual tumour was present in approximately 8 per cent of women with invasive and 16 per cent with *in situ* breast cancers after biopsy using the ABBI system. This makes reoperation mandatory at present. Larger (3 cm diameter) cannulas are being developed, but only experience with their use will determine whether they can reduce the residual tumour rate to clinically acceptable limits.

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