Tissue artefacts caused by sponges

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Abstract

Artefacts which occur during the processing of small biopsy specimens can cause sufficient tissue distortion to impair interpretation and can be a considerable source of nuisance. Triangular artefacts were noted in renal and liver biopsy specimens which were caused by foam sponges in embedding cassettes. Scanning electron microscopic examination of the sponges showed they comprised a mesh of scimitar-shaped rigid spikes which closely match the artefacts seen in the tissues.

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Tissue artefact, caused by foam sponges in embedding cassettes has recently been highlighted in the *American Journal of Surgical Pathology*.¹ This artefact has previously been described by other authors from North America where the use of sponges is widespread.^{2,3} However, the possibility of tissue distortion by sponges has largely gone unnoticed or unheeded.

For several years, artefacts such as those seen in fig 1 have been seen in histological sections at Freeman Hospital and were erroneously thought to be caused by toothed forceps. This was most notable in needle biopsy specimens of kidney and liver and was particularly severe in small needle biopsy specimens processed rapidly. This has occa-

sionally caused problems in biopsy interpretation. Similar artefacts have been seen in material referred from other centres.

Recently, we wondered if these artefacts could have been caused by foam sponges used in embedding cassettes (fig 2A) and our suspicions were confirmed by these articles. We carried out scanning electron microscopic examination of the sponges to determine their microstructure and found that they are composed of a mesh of scimitar-shaped rigid spikes which are triangular in shape (fig 2B). When unfixed tissues or tissues which are rapidly processed are placed in these sponges the tissue is distorted and this may significantly alter the ability to interpret the biopsy specimen.

The artefacts produced may also be subtle and have been misinterpreted as vascular spaces (fig 3A). A scanning electron photomicrograph of the sponge shows a cross-cut spike which has a sharp triangular end (fig 3B). These solid spikes can penetrate unfixed tissues and produce this artefact.

In conclusion, these sponges are responsible for a range of artefacts depending on the size of the biopsy specimen, on the degree of tissue fixation, and the consistency of the tissue. The authors of other papers have concluded that the advantage and convenience of using these sponges needs to be weighed against tissue artefacts which might impair biopsy interpretation. Consequently, we have taken appropriate action to alleviate this problem by

Figure 1 Many triangular artefacts (arrows) are seen within the biopsy and at the edges where the unfixed tissue has been compressed by the sponge (haematoxylin and eosin).

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Figure 2A An example of a foam sponge which is used in embedding cassettes.

Figure 2B Scanning electron microscopy of the sponge shows that it is composed of a mesh of scimitar-shaped spikes.

Figure 3A A triangular-shaped sponge artefact which could be misinterpreted as a vascular space (haematoxylin and eosin).

Figure 3B Scanning electron microscopy of a spike shows that it has a sharp triangular end with an identical shape to the artefact seen in figure 3A.

wrapping such material in perm paper during processing.

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