Eur J Cancer Clin Oncol, Vol. 23, No. 10, pp. 1439–1441, 1987.
Printed in Great Britain

0277–5379/87$3.00+0.00

Perspectives and Commentaries

A Pathologist's View on How Diagnostic Material Should be Obtained

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(A COMMENT ON: Pedersen L, Guldhammer B, Kamby C, Aasted M, Rose C. Fine-needle aspiration and tru-cut biopsy in the diagosis of soft tissue metastases in breast cancer. *Eur J Cancer Clin Oncol* 1986, **22**, 1045–1052.)

THE HIGH diagnostic value of fine needle aspiration cytology makes it a method of choice in cancer staging and surveillance. The article of Pedersen *et al.* [1] ascertained the superiority of fine needle aspiration (FNA) over tru-cut biopsy (TCB).

In addition to cases of breast cancer, many other indications can be proposed. In fact, any subcutaneous lump is a potential target for FNA and can be diagnosed or subtyped by cytology. FNA is not a biopsy, it does not share the methodology or the complications of the tru-cut surgical procedure; the puncture can be repeated until contributive information is obtained and it can be done on an out-patient basis for any superficial palpable mass.

Recent developments in imaging, using fluoroscopy, computerized axial tomography or echography have widened the use of FNA even to small masses localized deeply in thoracic, abdominal or pelvic sites. Biplane fluoroscopy has improved the guidance of the needle in these deep targets and stereotaxic approach has achieved the diagnostic reliability in a mass-screening project of unpalpable breast lesions in Sweden [2].

The most frequently used device, as popularized in Sweden, is composed of a 10–20 ml disposable syringe inserted in a pistol allowing a one-handed grip. For prostatic aspirates, a needle guide, as designed by Franzen, helps to fix the palpating finger [3]. The needle is thin enough (22–25 gauge) to avoid anaesthesia for superficial masses, and to minimize traumatic complications such as pneumothorax, air embolism or haemorrhage [4]. These possible contra-indications or others, such as the risk of tract dissemination, are nevertheless invoked by physicians who have a negative attitude towards the method. It has also been argued that larger needles would provide better material; however, thin needles are sufficient to aspirate thousands of cells, preserving their architectural patterns.

Good positioning of the patient improves the success of the sampling and permits a firm immobilization of the mass. Moreover, full information and psychological preparation of the patient is mandatory to obtain cooperation which is needed for a favourable outcome of the procedure, especially in transparietal needling. The patient's cooperation can reduce the incidence of false negative reports and avoid repeated aspirations.

When the needle transmits the characteristic feeling of "entering" the mass which indicates to the fingers the change to a hard consistency, lateral movements of the holder will displace the mass. Once the needle is accurately placed and whatever the surrounding tissues might be, the device is rotated or moved back and forth in the mass in order to disrupt the cells, thereby gaining in suction efficiency. While performing the aspiration, the operator should maintain the triggering movement and watch for the appearance of material in the hole of the syringe.

An apparent dry suction does not necessarily mean an unsuccessful procedure, especially if long

Accepted 16 December 1986.

needles are used: enough material may have been collected within the needle. It is essential, for the preservation of the cells, to release the vacuum when withdrawing the needle from the mass. This point is crucial and many physicians don't realize how quickly cells will be altered by drying on the syringe walls. If a deep X-ray guided aspiration is suspected to be dry, the needle should be kept in place while the material is smeared and stained extemporaneously.

Glass slides must be clean, labelled and prepared before the procedure; a fixative bottle with 95° ethyl alcohol should be ready with the cap unscrewed before smearing. Then, the syringe is disconnected from the needle. The pistol is moved in order to take enough air into the syringe to push the material out of the needle onto the glass slide.

Again to avoid drying, the tip of the needle should be put in contact with the slide when blowing out the material, in order to prevent desiccation; the slide is held at the frosted end at a 45° angle between the thumb and the index finger and the three remaining fingers are placed on the underside to ensure a firm support.

One drop of aspirate is enough for each slide. This drop is put on the uppermost right hand corner of the slide, then a second slide is placed horizontally, lengthwise at the height of the droplet (Fig. 1). In order to keep track of the architectural pattern of the aspirated specimen, the second slide is laid flat on the first one without enforcing any pressure, so as not to squash the cells (Fig. 2), and moved gently to smear the drop (Fig. 3).

The excess material of the first droplet can be wiped off the slide and respread on another slide in the same way. If the aspirate is very liquid, the second slide is used at a vertical angle of 45° and drawn back towards the frosted part of the slide before respreading it again. Under these conditions, as in the case of cyst aspiration, where the spread material is usually very watery, the excess fluid should be discarded and drained off onto some absorbent paper; the cells will remain on the slide, ready for spreading.

Half of the slides should be immediately fixed in 95° ethyl alcohol or alternatively by commercial spray fixatives; however, in inexperienced hands, the jet stream may blow up the cells from the slide if the container is held too close to the glass slide. The other half of the slides will be air dried for Wright staining and other special stains or for immunoperoxydase techniques.

The specificity and sensitivity of the method gradually improve with increasing experience. X-ray assistance and stereotaxic guidance have reduced the size of the target to less than 10 mm. The expertise of the radiologist is of major importance for the good outcome of the whole procedure. False negative reports are partly due to hazard but they can be reduced by the quality of the handling of the aspirate, as described here and elsewhere [3–6].

Overall, cytologists tend to make better smears than clinicians because they have to look at the slides; physicians should appreciate the potential benefit which they can derive from the presence of a trained cytologist in the operating room.

Within 2 min, "Diff-Quick"* staining can provide an estimate of the quality of the aspirate. A double head microscope will favour the dialogue between the radiologist, the physician and the pathologist, and more easily convince the person who is doing the aspirating to repeat it.

In conclusion, FNA is a valuable tool for morphological diagnosis; the method is almost free of contra-indications and side-effects; it is well accepted by the patient and can be repeated as often as necessary. Besides cytopathological diagnosis, it can provide material for many sophisticated techniques such as cell typing, cytogenetics and electron miroscopy.

The method is safe, rapid and cost effective. Training of all persons concerned is a prerequisite and requires a close collaboration between the clinician and the cytologist.

*Diff-Quick is the Trade Mark, catalogue No. 130832 C, of Merz-Dade AG, Switzerland.

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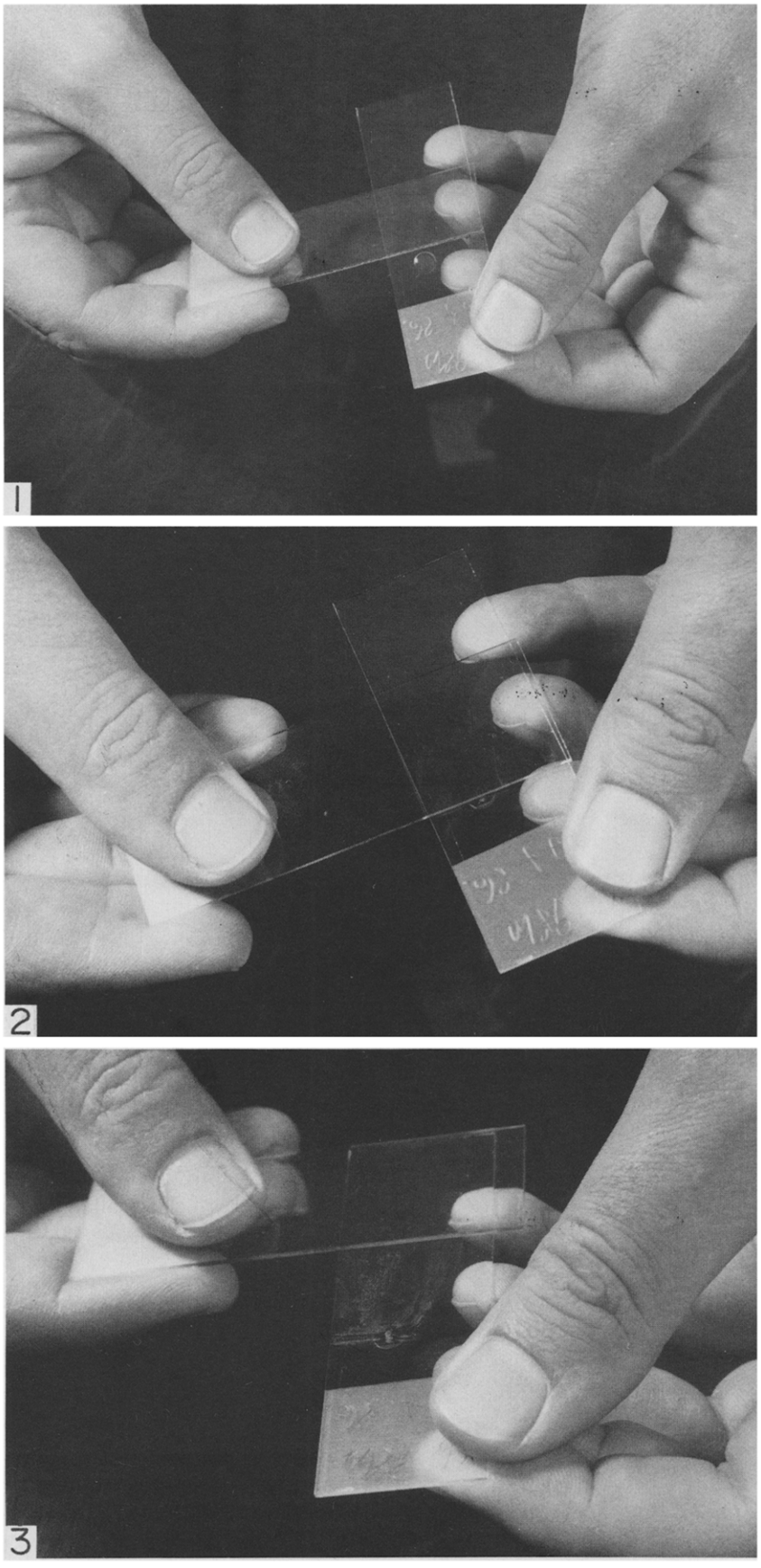

Figs. 1–3.