

Initial experience with novel micro-pulse biopsy system in axillary lymph nodes

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Aim

Recently a new biopsy method has been developed with technical characteristics well suited for challenging biopsy cases.

The aim was to get initial experience with this system and assess its suitability for use in axillary lymph nodes.

Materials

The new biopsy system (NeoNavia, NeoDynamics, Sweden) incorporates a pneumatic mechanism that provides impulses to the needle, allowing the operator to stepwise advance the needle through tissue with minimal effort (see fig 1.) [1]. This could provide greater control of the needle tip position. To maximize sampling yield a 14G open-tip full-core needle design is employed (see fig. 2&3). In combination with pulsed insertion this allows for an arbitrary sample length.

Method

Breast cancer patients undergoing surgery underwent a biopsy of axillary lymph nodes using the new system. Samples quality and tissue yield adequacy were judged by the operator and the pathologist.

Results

Four physicians performed 43 sampling attempts in 23 patients. In all attempts a sample was retrieved. 84% (36/43) of samples were judged "very good" or "good" by the operator. Tissue yield was judged adequate in 100% of cases by the pathologist when at least two samples had been obtained.

Summary

This constitutes first institutional hands-on experience with the novel biopsy system. The system offers potential for improving biopsy procedures and initial results in axillary nodes are promising. Further evaluation of the system is done in the PULSE trial, a multi-center study by the AWOgyn e.V. working group.

References

[1] Schässburger KU, Paepke S, Saracco A et al. High velocity pulse biopsy device enables controllable and precise needle insertion and high yield tissue acquisition. *Physica Medica*. 2018;46:25-31.

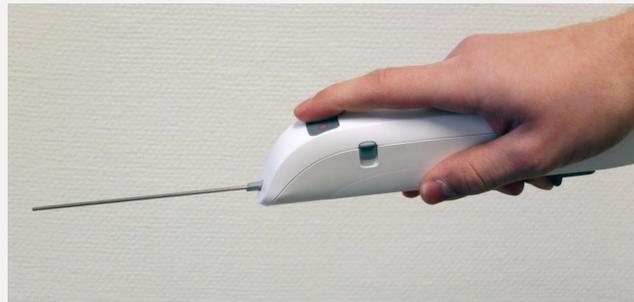


Fig.1. Micro-pulse biopsy system

The biopsy system consists of a base unit and a hand held biopsy device. The base unit generates vacuum suction as well as pressurized air driving the pulse-mechanism.

Fig. 2. NeoNavia sampling technique

- The needle is advanced through healthy tissue towards the suspicious lesion with the dissection tip extended.
- When facing the lesion, the dissection tip is retracted and exposes the cavity of the open-tip sampling needle.
- Pneumatic pulses are used to insert the sampling needle into the lesion. Vacuum assists in filling the needle with tissue.
- When the needle has been inserted a desired length it is rotated to cut off the sample.
- The needle is subsequently withdrawn and the dissection tip is extended to eject the tissue sample.

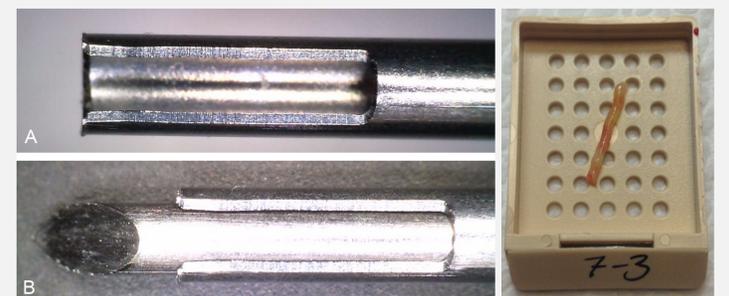
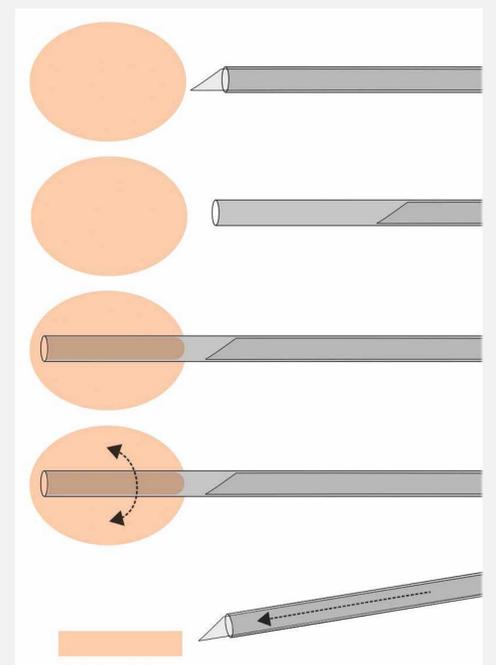


Fig.3. Biopsy needle and tissue sample

(A) shows a magnified image of the open-tip sampling needle when it is inserted into the lesion. The dissection tip is at a position 60 mm retracted into the sampling needle. A slit can be seen as well as the inward grind at the needle tip.

(B) shows the tip of the biopsy needle with the dissection tip in an extended position. The dissection tip prevents healthy tissue from entering the sampling needle during insertion towards the lesion.

The picture on the right shows an example of a full-core tissue sample obtained with the micro-pulse biopsy system.