Overview of vacuum-assisted breast biopsy

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Learning objectives

The aim/ focus of this poster is:

- To provide a short overview of the use of vacuum-assisted breast biopsy (VABB).
- To discuss the indications, contra-indications and potential risks of VABB.
- To review the procedure of stereotactic-, ultrasound and MRI-guided VABB.
Fine needle aspiration (FNA) has been used for a long time initially to evaluate palpable breast masses without imaging and subsequently to identify non-palpable masses under stereotaxy and ultrasound. A big advantage of FNA is that it can be performed quickly, easily and with good sensitivity and specificity in experienced hands. The major disadvantage however is the lack of ability to distinguish between in situ and invasive cancer. Today, it can still be used as a tool to make an in office differentiation between cystic and solid lesions.

Core needle biopsy gives a more definitive diagnosis because it offers a histologic diagnosis compared to FNA. It is a safe, cost-effective and minimally invasive procedure that is well tolerated by patients. In stereotactic biopsy, Bagnall et al. [1] recommend that three or more cores should contain calcifications or five or more flecks of calcifications must be seen in total to ensure 100% sensitivity. This number of calcifications is usually not achieved with core needle biopsy. There is also a risk of underestimation of disease due to insufficient tissue especially in complex sclerosing lesions. Therefore, the main disadvantage of core needle biopsy is false-negatives due to sampling error and/or insufficient tissue.

Vacuum-assisted breast biopsy (VABB) was introduced in the mid 90’s. It was developed to overcome the shortcomings of fine needle aspiration (FNA) and core needle biopsy. It has the main advantage that it allows removal of large and multiple tissue samples in a single insertion diminishing sampling errors and the problem of insufficient tissue. A meta-analysis of 21 VABB-studies showed that it has a sensitivity of 98% and a specificity of nearly 100% [2]. Therefore VABB is widely accepted and a growing procedure in patients with a suspicious breast abnormality or palpable breast mass. Identification, assessment and appropriate further management are important in the diagnostic work-up. A suboptimal use of VABB can be detrimental to the patients’ outcome.
Findings and procedure details

It is often not possible to come to a single correct diagnosis just based on imaging. Obtaining a histological diagnosis by stereotactic-, ultrasound- or MRI-guided vacuum-assisted breast biopsy (VABB) will ensure the most appropriate treatment regime. Several VABB systems are available on the market like Atec® (Hologic, Inc. Bedford, MA, USA), Vacora® (Bard, Inc. Murray Hill, NJ, USA), Encor® (SenoRx, Inc. Irvine, CA, USA; Fig. 1 on page 17), Eviva® (Hologic, Inc. Bedford, MA, USA) and Mammo tome® (Ethicon Endo-Surgery, Inc. CN, Ohio, USA). They are all compatible with mammography (stereotaxy), ultrasound and MRI. A double-lumen probe is used to make a vacuum and to transport tissue samples backward into the collecting chamber. During the procedure it is possible to administer extra anaesthetics through the needle if necessary. The vacuum is used to suck tissue into the needle opening for being sampled. It also sucks blood out of the biopsy area preventing haematoma.

INDICATIONS:

Stereotactic biopsy:

- Suspicious breast lesions defined as Breast Imaging and Reporting Systems (BI-RADS) 4

- BI-RADS 5, highly suspicious lesions.

- Especially evaluation of suspicious microcalcifications (BI-RADS 4-5) is a good indication for stereotactic guided-VABB.

- A general consensus for BI-RADS 3 lesions has not yet been reached. Mendez et al. [3] recommend a biopsy in BI-RADS 3 with microcalcifications because of noncompliance with short-interval follow-up recommendations.

- Stereotactic VABB may not be considered as a therapeutic procedure, even in the case of complete removal of microcalcifications. However, a complete removal of microcalcifications may result in low rates of underestimation of malignancy and may consequently increase the diagnostic accuracy of the diagnostic procedure [4].

Ultrasound:

- Each suspicious abnormality (BI-RADS 4 or -5) that can be identified by ultrasound should undergo ultrasound-guided vacuum biopsy as first choice. Real-time visualisation of the suspicious lesion is the main advantage.
- Evaluation of suspicious axillary lymph nodes preoperatively as an alternative to surgical sentinel node biopsy

- Therapeutic excision of probable benign lesions (BI-RADS 3 e.g. fibroadenomas and papillomas) is an alternative for open biopsy. Lesions up to three cm can be completely removed with minimal scarring.

**MRI:**

- Used for suspicious lesions (BI-RADS 4 and 5) seen on MRI that can't be seen on mammography neither on ultrasound.

- Suspicious lesions visible during two menstrual cycles. If a lesion is seen on MRI between days 5-17 of the menstrual cycle and if the biopsy is not urgent or malignancy is not proven, a follow-up MRI should be performed prior to a MRI-guided breast biopsy in order to prevent unnecessary MRI-guided biopsies [5].

Imschweiler et al. [6] reviewed 9,113 VABBs in Switzerland and showed that there is a significant higher technical success rate for ultrasound-guided VABB compared to MRI-guided VABB (p<0.001). This is probably due to a more complex technique and longer intervention periods of MRI-guided biopsy. However, no significant differences were shown in technical success rate between MRI-guided and stereotactic-guided procedures.

**CONTRA-INDICATIONS:**

- Patients on anticoagulant or antiaggregant treatment. This is a relative contra-indication. Most agree that the patient should have stopped these medications for at least a week prior to VABB (in consultation with the attending physician).

- Patients with a known contra-indication to MRI in case of MRI-guided biopsy.

- In patients with a known allergy to local anaesthetics or contrast agents, careful preparation is mandatory.

- Patients with a known renal impairment (in case of MRI-biopsy). The risk of developing nephrogenic systemic fibrosis is least likely by using Dotarem® (Guerbet), Gadovist® (Bayer) or Prohance® (Bracco).

**POTENTIAL RISKS:**

- Infection or poor wound healing.
- Hematoma or bleeding.
- Cosmetic impairment (however less common compared to surgical biopsy).
- Injuring of nearby anatomic structures e.g. pneumothorax.

ADMINISTRATION AND PREPARATION:

- Take time to explain the procedure, the potential risks but also take time to comfort the patient.
- Oral or written informed consent.

STEREOTACTIC-GUIDED BIOPSY

Material:

- Biopsy system of choice.
- Needle: Depending on the system you use, there is choice between two or three needle sizes. Atec® and Eviva® from Hologic offers a 9-G or 11-G needle, Vacora a 10-G or 14-G needle. Mammotome® an 8-G or 11-G needle and Encor® a 7-G, 10-G or 12-G needle. Jackmann et al. [7] demonstrated in a series of 1280 stereotactic vacuum-assisted breast biopsies using 11-G and 14 G needles that false negatives were least common with 11-G probes (0,45% vs. 4,4%; p=0,019). There is no significant difference between 9-G or 11-G biopsy in histological underestimation [8]. Larger needles allow larger sampling volumes in a shorter time, no differences in complication rates are seen but they are often a bit more expensive. In our centre the Encor® system is routinely used with a 10-G needle.
- Marker - clip

Local anaesthesia with and without adrenaline (2 x 10 ml). For the skin, we use a local anaesthetic without adrenaline in order to prevent skin necrosis. In depth, adrenaline (2%) is added to the local anaesthetic to minimize bleeding.

- 2 syringes of 10 ml and two needles (a subcutaneous - and a intramuscular needle) to administer the anaesthetics.
- Skin disinfectant e.g. Hibitane 0,5%, 10 ml
- Surgical scalpel blade No. 11
- Sterile gloves.
- Sterile compresses (big and small)
- Sterile drapes.
- A petri dish or absorbent paper on which the tissue is placed for a mammography.
- Little pot with a solution of 10% formaldehyde to fixate the tissue/specimen.
- Steri-Strips® (3M) or Dermabond® (Ethicon)
- Opsite® Post-Op

Procedure:

1. Position:

The patient can be placed in prone, sitting, semireclining lateral or upright position. A special table is necessary for prone position, which is an extra cost and also takes more space. Although it offers several advantages: motion artefacts are reduced, it lowers the risk of fainting and it is also more comfortable for the patient. In each position the patient should be placed in a way that she is comfortable and that offers a good access to perform the biopsy. The shortest path to the lesion is recommended. If the procedure is not performed in prone position, a cranio-caudal or lateromedial biopsy approach is possible (Fig. 2 on page 17).

2. Localization of the lesion:

- Scout view (0°) (Fig. 3 on page 17A): the lesion should be circa in the centre. If not: reposition the breast and repeat the scout view. If not in the centre, it is possible you will not see the lesions on both stereotactic views (see next point). Be sure the lesion you see, is the suspicious one: confer with initial mammography.

- Two stereotactic views (-15° and +15°) (Fig. 3 on page 17B-C): this allows calculation of the depth of the suspicious lesion.

- Mark the lesion on the stereotactic views. The computer will calculate the correct biopsy position. This information can now be transferred to the biopsy system.

- Before firing, make sure the stroke margin is okay. This is the distance from the tip of the probe to the back of the breast/plate in postfire position. If there is a so-called negative stroke margin, the needle will exit the breast or hit the rear compression plate in the postfire position. Some systems will warn you.
3. Anesthesia.
- For the skin, we use a local anaesthetic without adrenaline in order to prevent skin necrosis. In depth, adrenaline (2%) is added to the local anaesthetic to minimize bleeding. We use about 10 ml both for superficial and for in-depth anesthesia. Place the tip of the probe against the breast, retreat, disinfect and create a skin incision at this position with a surgical scalpel blade No. 11 (Fig. 4 on page 18).

4. Fire
- The correct position of the probe in the breast in relation to the suspicious lesion is checked with a presampling stereotactic image (Fig. 3 on page 17D). This is important because the patient might have moved or the position of the lesion might have changed during the probe insertion.

- During the actual biopsy, the created vacuum sucks the tissue into the rotating-cutting needle. Tissue is collected from a 360° radius and transported backward into a storage chamber.

- Most biopsy systems need to be manually turned where the Encor® system turns automatically. This automatic rotation can be followed on the screen. In non-automated systems, it is important to make sure the needle is closed during manual rotation.

- The number of obtained tissue samples depends on the needle size. Generally a minimum of 10 samples is obtained for 10-11-G biopsy and four to six samples for 7-9-G biopsy.

- It is possible to take a control mammography with the needle in situ. Check if biopsied region is the same as the area with microcalcifications (Fig. 3 on page 17E).

- At the end of the actual biopsy, it is recommended to place a titanium marker with a collagen or polyvicryl coating at the biopsy site. This marker is visible under x-ray, ultrasound and MRI, and can be useful in follow-up or subsequent breast surgery. Different shapes of markers can be used to identify different lesions.

- Make sure the needle is closed before removing it out of the breast.

5. Post biopsy
- Compress the biopsy site and channel (not only on the visible wound) with a flat hand to prevent hematoma.

- If good hemostasis is accomplished, close the wound with Steri-Strips® (3M) or Dermabond® (Ethicon) and cover these with an Opsite® Post-Op adhesive plaster.
- Take a control mammography (craniocaudal and mediolateral) to evaluate correct sampling and good position of the marker (Fig. 3 on page 17F and Fig. 5 on page 19). If on the images is seen that the clip has migrated from the biopsy site, a report should added to the patients file. Clearly register in this situation that the clip shouldn't be used as a guide/orientation during surgery.

- Put the obtained tissue samples on a petri dish or absorbent paper and make an x-ray image of it. Verify if the microcalcifications can be found in the specimen to be sure the correct site has been biopsied (Fig. 6 on page 19).

**ULTRASOUND-GUIDED BIOPSY**

*Material:*

- Biopsy system of choice.

- Needle: similar as under stereotactic-guided biopsy (see higher). Hahn et al. [9] recommend the use of an 8-G needle for firm breast tissue due to its sharp scalpel point and especially for complete removal of benign lesions. In our centre the Encor® system is routinely used with a 10-G needle.

- Marker - clip

- Local anaesthesia with and without adrenaline (2 x 10 ml). For the skin, we use a local anaesthetic without adrenaline in order to prevent skin necrosis. In depth, adrenaline (2%) is added to the local anaesthetic to minimize bleeding.

- 2 syringes of 10 ml and two needles (a subcutaneous - and a intramuscular needle) to administer the anaesthetics.

- Skin disinfectant e.g. Hibitane 0,5%, 10 ml

- Surgical scalpel blade No. 11.

- Sterile gloves.

- Sterile compresses (big and small)

- Sterile drapes.

- Sterile ultrasound gel.

- Little pot with a solution of 10% formaldehyde to fixate the tissue/specimen.
- Steri-Strips® (3M) or Dermabond® (Ethicon).

Procedure:

1. Position.

- The patient is placed in a supine position.

- Elevate the ipsilateral arm over the head for tightening the skin and to decrease tissue depth.

- The physician sits at the side of the biopsied breast with a view on the ultrasound monitor at the other side of the patient. The height of the biopsied breast should be at the level of the physician's breast/chest. If the patient is positioned too low, the probe might be inserted to vertical and might injure the chest wall e.g. pneumothorax.

2. Localization of the lesion:

- Localize the lesion with a linear ultrasound transducer (at least 10 MHz).

- When the lesion is visualised, change the transducer from the dominant to non-dominant hand. You now have a free hand to perform the procedure.

3. Anesthesia (Fig. 7 on page 20A).

For the skin, we use a local anaesthetic without adrenaline in order to prevent skin necrosis. In depth, adrenaline (2%) is added to the local anaesthetic to act longer and to minimize bleeding. We use about 10 ml both for superficial and for in-depth anesthesia. Try to avoid injecting air because this can interfere with ultrasound visualisation.

4. Sampling.

- Create a skin incision with a surgical scalpel blade No. 11 about two centimetres from the transducer's edge (Fig. 7 on page 20B).

- Make sure the probe is closed during breast entry because this can cause tissue damage.

- It is recommended to introduce the transducer not too vertical and parallel to the transducer for best visualization (Fig. 7 on page 20C).
- Try to get visualization of the whole probe and the lesion in the same imaging plane (Fig. 8 on page 20B).

- Guide the tip of the probe just below the lesion.

- Sampling now can start: the vacuum sucks the tissue into the rotating-cutting needle and the cut tissue is transported backward to a storage chamber. As sampling proceeds, you will see shrinking the lesion in real-time (Fig. 8 on page 20C).

- The number of obtained tissue samples depends on the needle size. Generally a minimum of 10 samples is obtained for 10-11-G biopsy and four to six samples for 7-9-G biopsy. However, ultrasound VABB can be continued until the lesion is not longer visualized.

- At the end of the actual biopsy, it is recommended placing a titanium marker with a collagen or polyvicryl coating at the biopsy site (Fig. 8 on page 20D). This marker is visible under x-ray, ultrasound and MRI, and can be useful in follow-up or subsequent breast surgery. Different shapes of markers can be used to identify different lesions.

- Make sure the needle is closed before removing it out of the breast.

5. Post biopsy

- Compress the biopsy site and - channel (not only on the visible wound) with a flat hand to prevent hematoma.

- If good hemostasis is accomplished, close the wound with Steri-Strips® (3M) or Dermabond® (Ethicon) and cover these with an Opsite® Post-Op adhesive plaster.

- Take a control mammography (craniocaudal and mediolateral) to evaluate correct sampling and good position of the marker. If on the images is seen that the clip has migrate from the biopsy site, a report should be added to the patients file. Clearly register in this situation that the clip shouldn't be used as a guide/orientation during surgery. However, marker migration is less common with US compared to stereotactic procedures due to the lack of compression.

**MRI-GUIDED BIOPSY**

Material:

- MRI-scanner (minimum 1.5 Tesla) with dedicated breast coil.

- Biopsy system of choice with dedicated biopsy grid.
- Only MRI-compatible material can be brought into the MRI-room like an adapted foot paddle, the trocar, the cannula, the obturator, the grid cube and the biopsy driver with needle (Fig. 9 on page 21). The vacuum console itself can't enter the room, it should be left at the door entrance. (Fig. 10 on page 22) It is also possible to use a mobile MRI-table, which can be conducted out of the MRI-room with the patient on it. In the latter case, the tissue sampling is performed in another room and the MRI will be available for other patients.

- Needle: similar as under stereotactic-guided and ultrasound-guided biopsy (see higher). In our centre the Encor® system is routinely used with a 10-G needle.

- Marker - clip

- Local anaesthesia with and without adrenaline (2 x 10 ml). For the skin, we use a local anaesthetic without adrenaline in order to prevent skin necrosis. In depth, adrenaline (2%) is added to the local anaesthetic to minimize bleeding.

- 2 syringes of 10 ml and two needles (a subcutaneous - and a intramuscular needle) to administer the anaesthetics.

- Infusion of paracetamol IV 100 ml, 1 g.

- Skin disinfectant e.g. Hibitane 0,5%, 10 ml

- Surgical scalpel blade No. 11.

- Sterile gloves.

- Sterile compresses (big and small)

- Sterile drapes.

- Little pot with a solution of 10% formaldehyde to fixate the tissue/specimen.

- Steri-Strips® (3M) or Dermabond® (Ethicon).

- Opsite® Post-Op

Procedure

1. Position.

- The patient is placed prone on the table with the breast in a dedicated breast coil. Make sure the patient is in a comfortable position to prevent motion.
- Place the biopsy grid next to the ipsilateral breast. A lateral approach is preferred. Newer models allow medial approach but it carries a higher risk of injuring the mammary artery branches running in the upper medial quadrant and it is also an uncomfortable working position for the physician.

- Give a gentle compression between the grid, the (medial and lateral) plates and the breast. Don’t compress too hard because this will interfere with contrast enhancement of the lesion.

- Depending on the physician's choice, it is possible to use a grid or a post-and-pillar localization system. We prefer a grid because of its ease to use.

- A fiducial marker is placed in the centre of the grid.

2. Localization of the lesion.

- Take scout images in axial, sagittal and coronal planes.

- T1-weighted MRI pre- and postcontrast (Gadolinium) images are obtained in an axial plane of the index breast. Biopsy is the only indication for performing a unilateral breast MRI. These images don't have a diagnostic value and can't be used in follow-up.

- We routinely use subtraction techniques of the images for a good identification of the lesion. (Fig. 11 on page 23)

- It is possible that the lesion can't be identified because of changes in the hormonal status or due to too strong compression of the breast.

- Localizing the lesion is based on axial and sagittal images. The total needle depth is best seen on axial images. It is the depth from the lesion to the skin plus the two cm of the guide block. The correct grid opening is determined on sagittal images by scrolling from the lesion to the side where the grid is situated; and compare it with the fiducial marker. Be careful because orientation mistakes are easily made. Use the adequate worksheet for transferring information (Fig. 12 on page 24).

- It is also possible to calculate the coordinates automatically with computer aided detection (CAD) software (Fig. 13 on page 25). The program will provide grid localization and depth of the lesion.

3. Anesthesia.

- Disinfect the skin with a disinfectant of choice e.g. Hibitane 0,5%, 10 ml.

- For the skin, we use a local anaesthetic without adrenaline in order to prevent skin necrosis. In depth, adrenaline (2%) is added to the local anaesthetic to minimize bleeding.
These anaesthetics should be administered at the calculated place in the grid opening. We use about 10 ml both for superficial and for in-depth anesthesia. If needed, extra anaesthetics can be administered during the procedure through the probe by some systems.

4. Sampling

- Create a skin incision at this position with a surgical scalpel blade No. 11. A vertical (nipple-thorax axis) incision is preferred, as the scar will have better cosmetic result.

- The cannula is pre-set on the right depth with the sliding system.

The trocar is inserted into the cannula and this duo is inserted into the grid block. The combination of grid block, cannula and trocar is now introduced in the right orientation in the appropriate grid opening.

- The trocar will pierce the breast tissue to the pre-set depth and give access to the suspicious lesion.

- The grid cube and cannula stay in place, the trocar is withdrawn and replaced by the obturator. This is a MRI-compatible and visible stick used to visual verification prior to sampling.

- Revisualisation of the region of interest is now obtained in an axial plane (Fig. 14 on page 25). The obturator should be visualised in the centre of the biopsy region because the tip of the obturator corresponds with the central position of the sampling probe.

- The obturator will be replaced by the biopsy system with needle (Fig. 15 on page 26). The vacuum sucks the tissue into the rotating-cutting needle and the cut tissue is automatically transported backward into a collecting chamber.

- The number of obtained tissue samples depends on the needle size. Generally a minimum of 10 samples is obtained for 10-11-G biopsy and four to six samples for 7-9-G biopsy.

- At the end of the actual biopsy, a titanium marker with a collagen or polyvicryl coating is mandatory placed at the biopsy site (in contrast with stereotactic and ultrasound biopsy where it is recommended). By placing a marker, the lesion can now also be visualised on mammography or ultrasound. This can be useful in follow-up or subsequent surgery. Different shapes of markers can be used to identify different lesions.

- A final sagittal sequence through the biopsied region is performed to verify the location of the sampling defect and the marker. However, evaluation of complete removal can be difficult: blood can obscure the MRI-view and contrast washout may falsely appear as complete removal of the lesion. An alternative for evaluation the marker's position is performing a mammography instead of an MRI.
5. Post sampling

- Remove the cannula out of the breast and release the patient out of the coil.

- Compress the biopsy site and -channel (not only on the visible wound) with a flat hand to prevent hematoma.

- If good hemostasis is accomplished, close the wound with Steri-Strips® (3M) or Dermabond® (Ethicon) and cover these with an Opsite® Post-Op adhesive plaster.

- Like said higher, and additional or solitary control mammography can be performed (craniocaudal and mediolateral) to evaluate correct sampling and a good position of the marker. If on the images is seen that the clip has migrate from the biopsy site, a report should added to the patients file. Clearly register in this situation that the clip shouldn't be used as a guide/orientation during surgery.

ANATOPATHOLOGICAL ANALYSIS:

The obtained tissue samples are fixated in 10% buffered formalin and send to pathology department for further analysis. A histologic evaluation will be made and a BI-RADS 1-5 classification will be given. If the suspicious lesion is malignant, the pathologist will also provide the type of tumour, its invasive or non-invasive character and its hormone receptor status.

POST-BIOPSY INFORMATION:

- The patient is given a compressive bandage. She should wear this for about two weeks together with her bra, even at night.

- However VABB is an in-office procedure, she should not drive home herself.

- The patient should not do hard labour, not even raise the ipsilateral arm for about a week.

- The patient should keep the wound dry for about ten days and be cautious while showering.

- The patient is given information about how and when she will receive the results of the biopsy.

- The patient can use pain medication if needed e.g. paracetamol.
- The patient is instructed in case of any problems, to contact her general physician or radiologist.

- All this information can also be found in a brochure given to the patient.

POST-BIOPSY REPORT:

The executive radiologist makes a report of the procedure. This report should contain breast side, location, type of lesion (BI-RADS), size of lesion, type of device used, the gauge-number used, number of samples, microcalcifications in the obtained sample in case of stereotactic biopsy (yes/no), marker-clip placed (yes/no) and completeness of removal.
Fig. 1: SenoRx Encor® vacuum system with a detail of the sampling needle.
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Fig. 2: Upright vertical approach (left) and a lateral arm stereotactic add-on (right).
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Fig. 3: Overview of stereotactic images. A-C: scout view, -15° and +15° stereotactic views. D: presampling image with needle in situ. E: postsampling image with needle in situ. F: postsampling with marker.

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**Fig. 4:** Disinfection, anesthesia and skin incision for stereotactic-guided biopsy.

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**Fig. 5:** Presampling mammography with microcalcifications (left). Postsampling mammography with marker in the biopsied area (right).

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Fig. 6: Obtained tissue on x-ray to verify for calcifications.

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Fig. 7: A: Administration of local anesthetics. B: Incision. C: Sampling needle parallel to transducer.

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Fig. 8: A: Fibroadenoma. B: Needle in situ with the lesion centered at the probe opening. C: As sampling proceeds, the lesion is becoming smaller. D: Marker in situ at the border of the residual hematoma.

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**Fig. 9:** MRI-compatible tools: trocar, grid cube, obturator, cannula and biopsy device with needle.

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**Fig. 10:** The vacuum console can’t enter the MRI room, it should be left at the door entrance.

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Fig. 11: T1-weighted images with and without contrast enhancement (left and middle). Subtraction image to identify the lesion more easily (right).

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Fig. 12: MRI grid worksheet, used for localizing the lesion's position.
Fig. 13: Software for calculating the lesion’s depth and its location in the grid.

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**Fig. 14:** Obturator in the breast to verify the correct sampling position.

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Fig. 15: MRI-guided biopsy in progress: needle driver, guiding cannula and cube in the grid.

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Conclusion

Minimally invasive breast biopsy is in most cases the procedure of choice in patients with a suspicious mammographic abnormality or palpable breast mass. Compared to fine-needle aspiration (FNA) and core-needle biopsy, vacuum assisted breast biopsy (VABB) can remove larger and multiple tissue samples in a single breast insertion. This is associated with less frequent underdiagnosis of malignant lesions. It can also be used as a therapeutic procedure in histology proven benign lesions.

VABB is a safe, sensitive, specific and widely accepted procedure. It is a less invasive and a more cost-effective procedure than open surgical biopsy. Ultrasound-guided biopsy is the technique of preference because of its real-time visualisation with subsequent high technical success rates. Stereotactic VABB is especially useful for identification of microcalcifications. MRI is used for suspicious lesions that can't be seen on mammography neither on ultrasound. Identification, assessment and appropriate further management are important in the diagnostic work-up. A suboptimal use of VABB however, can be detrimental to the patients’ outcome.
References


