

## **Appendix: Opinion views on ultrasound-guided vacuum-assisted breast biopsy (VABB)**

### **1. Preoperative preparation and evaluation**

(1) No contraindication to surgery. (2) Complete imaging data. (3) Preoperative ultrasonography positioning and determining the puncture sites. (4) Signed informed consent forms.

### **2. Selecting the ultrasonography position**

The position depends on the location of the lesion and ease of operation. The committee recommends choosing the supine position or 45° lateral position.

### **3. Operation process**

(1) Equipment preparation: prepare the rotary scalpel and confirm the negative pressure and transmission effect. (2) Sterilization: Routine Sterilization. Cover the ultrasound probe with a sterile cover. (3) Anesthesia: When using local anesthesia, try to align the needle parallel to the long axis of the probe and infiltrate around the lesion or directly inject anesthetics into the gap between the breast and pectoralis major. The region of local anesthesia should exceed the position where the top of the rotary scalpel is intended to enter. (4) Placing the rotary scalpel: Under ultrasound guidance, place the collection slot of the rotary scalpel under the mass. It should be noted that the sampling window was positioned during scalpel placement to avoid additional damage to the skin and adjacent tissues. (5) Biopsy or resection: After confirming the correct position, adjust the collection slot to the sampling or biopsy state, select the operating handle or the foot control panel to control the equipment, and perform rotary cutting of the lesion until the predetermined operation is completed under ultrasound monitoring. (6) Re-examination: At the end of the resection, ultrasonographic re-examination is performed to ensure no residual lesion. (7) Compression to stop bleeding: aspirate the residual blood in the cavity and compress the cavity from the surface of the breast for 10–15 minutes. After confirming that there is no active bleeding, apply gauze packing to the breast surface, or place a drain through the incision or suture the wound (delayed closure). After the operation, the breast are pressure bandaged, which should be maintained for no less than 24 hours. (8) Submit for testing: The excised specimens are sent for pathological testing.

### **4. Matters requiring attention**

#### **4.1 Incision selection**

The incision should be selected according to the principles of proximity and aesthetics. The number of incisions should be minimized for multiple lesions.

#### **4.2 Use of anesthetics**

Regarding local anesthetics, a single dose of lidocaine should not exceed 400 mg; <sup>[1]</sup> epinephrine hydrochloride can be added to local subcutaneous anesthetic at a ratio of 1:200000 or 1:100000 to

reduce intraoperative hemorrhage [2] and extend anesthesia time. This approach should be used with caution in patients with hypertension and heart disease.

#### 4.3 Model of rotary scalpel

Choose the rotary scalpel according to the size of the mass and the reason for surgery.

#### 4.4 Needle insertion depth and angle

Attention should be paid to the needle insertion depth and angle during puncture to avoid accidental injuries, such as piercing into the thoracic cavity.

#### 4.5 Rotary incision procedure

When resecting larger lesions, the committee recommends using fan-shaped, rotating, and multi-directional cutting at the base of the lesion, to create a gradual cutting plane upward from the bottom of the lesion. It is essential to carefully distinguish between the excised specimen and the normal gland.

#### 4.6 Bilateral breast lesions or multiple lesions

Contamination caused by accidental malignant tumor cell release should be considered. Removing bilateral breast lesions with the same rotary scalpel is prohibited. If the same rotary scalpel is used to remove multiple lesions in a single breast, masses can be resected individually according to the BI-RADS classification from low- to high-risk.

### References

1. Chinese Pharmacopoeia Commission. Instructions for Clinical Use of the Pharmacopoeia of the People's Republic of China. Chemical Medicines and Biological Products. Beijing: China Medical Science Press, 2011: 122.
1. Chinese Pharmacopoeia Commission. Instructions for Clinical Use of the Pharmacopoeia of the People's Republic of China: 2010 Edition, Chemical Medicines and Biological Products . Beijing: China Medical Science Press, 2011:214.