#878 Evaluation of the feasibility of ultrasound-guided clipping of suspicious intramammary lesions in primary breast cancer patients receiving neoadjuvant therapy (Ultra3Detect)

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Background

Patients with early breast cancer and an aggressive tumor biology are increasingly being treated with neoadjuvant systemic therapy (NST) [1,2]. The proportion of patients with pathological complete response (pCR) is on the rise due to the use of modern chemotherapy regimens and targeted therapies, especially in patients with human epidermal growth factor receptor 2 positive (HER2+) and triple negative breast cancer (TNBC) [3,4] with pCR rates around 50%. It is, therefore, important to mark a lesion before the start of NST to ensure safe localization of the (initially) suspicious area of the breast and surgical removal of the remaining tumor tissue during a later surgery after completion of NST.

In case of pCR, localization of the clip is often performed under mammographic control, but this procedure entails additional radiation exposure and increased personnel, time, and financial burden. Therefore, ultrasound-guided wire marking would be preferred. In a previous study including 50 patients with early breast cancer, an intramammary lesion was marked with the Tumark® Vision clip (SOMATEX® Medical Technologies, Berlin, Germany) [5]. The clip, which immediately unfolds into a 3-dimensional spherical structure after insertion into the tissue, could be detected by both ultrasound and mammography in all patients after the intervention (**Figure 1**).

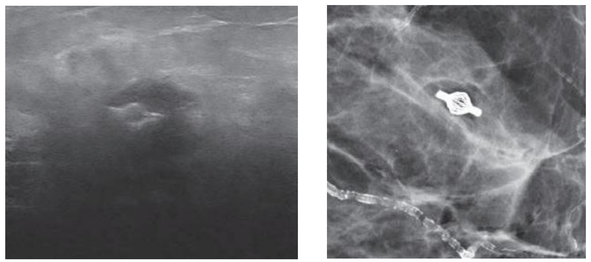

Figure 1: Visibility of the Tumark® Vision clip on ultrasound (left) and mammography (right) images.

The present study aims to evaluate the sonographic detection rate of the intramammary Tumark® Vision clips after NST in clinical practice and the proportion of patients in which the clip cannot be detected, and thus the rate of mammography-guided wire markings.

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Conflict of interest*

*of the first (Efstathia Vlachou) and presenting author (Mattea Reinisch)

M. Reinisch received personal fees (advisory board) from Somatex, Lilly, Roche, Novartis, Daiichi Sankyo, AstraZeneca, MSD, Pfizer, and Seagen and non-financial support for travel expenses from Pfizer, Novartis, and Celgen. E. Vlachou has nothing to disclose.

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Trial Design

The **Ultra3Detect** study (ClinicalTrials.gov ID: NCT04468113) is a **multicenter, prospective, investigator initiated registry**. All patients with suspicious findings of intramammary foci detected by ultrasound, scheduled for ultrasound-guided core biopsy and marking of the lesion with the Tumark® Vision Clip (marker) are informed about the possibility to participate in the Ultra3Detect study. For the prospective registration, patient data are checked for fulfillment of **inclusion and exclusion criteria**.

Inclusion criteria

- female patient aged ≥ 18 years
- suspicious unilateral or bilateral intramammary foci that can be identified by ultrasound
- no evidence of distant metastasis
- indication for breast conserving therapy
- no prior clip placement in the confirmed intramammary carcinoma
- patient are able to undergo NST treatment
- patient's consent to NST
- high compliance and high number of planned relevant surgical interventions in participating study center
- patient can understand the scope of this prospective registry study
- written informed consent

Exclusion criteria

- allergy to titanium and/or nickel
- pregnancy
- ipsilateral relapse
- prior extensive breast surgery (starting from quadrant resection)
- inflammatory or extramammary breast cancer
- multicentric or multifocal breast cancer
- patient is not operable
- patient is already undergoing adjuvant/neoadjuvant therapy

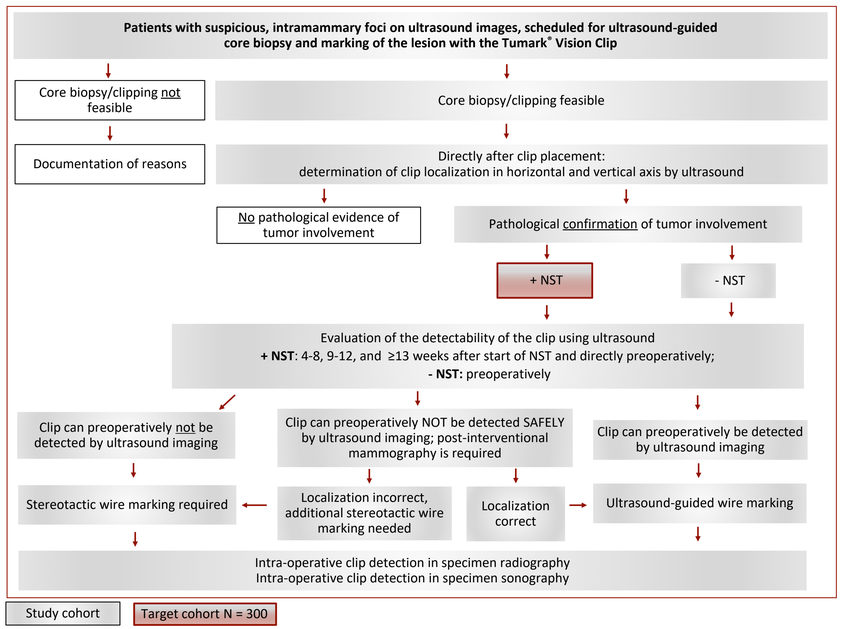

Figure 2: Flowchart of the Ultra3Detect study. NST (neoadjuvant systemic therapy)

If a core biopsy of the sonographically suspicious lesion is successful, the center of the tumor bed is marked with the Tumark® Vision clip in the same surgical session. Subsequent therapeutic procedures are determined individually based on the dialogue between patient and treating physician and guideline recommendations.

The study flowchart (**Figure 2**) shows the variety of possible treatment paths. The main focus is on the evaluation of patients receiving NST (**target cohort, n = 300**).

Primary study endpoint

Sonographic detection rate of clips at the time of surgery after completion of NST treatment of at least 12 weeks in patients with HER2+ and TNBC

Secondary study endpoints

- number of ultrasound-guided clip placements per patient
- rate of successful clip placements in the tumor center
- visibility of the cannula
- complications associated with the application of the clip
- sonographic detection rate of clips immediately after clip placement as well as after 4–8, 9–12, and ≥13 weeks of NST treatment and preoperatively in all patients receiving NST
- sonographic detection rate of clips in all patients receiving NST and with pCR
- sonographic detection rate of clips immediately after clip placement and preoperatively in patients not receiving NST
- intraoperative detection rate of the clip on specimen radiographs and specimen ultrasound images
- proportion of patients requiring preoperative, mammography-guided wire marking
- proportion of patients with mammographic verification after inconclusive ultrasound-guided wire marking of the clip
- proportion of patients with artifacts caused by clips on ultrasound and/or mammography images
- number of patients with complete pathological remission defined as ypT0/is, ypN0

Recruitment status

Since the start of enrollment in May 2020, **172 patients have been registered** in **19 study centers** (**Figure 3**). Thereby, (172 of 300) **57.3% of the target cohort** has been enrolled.

Figure 3: Number of patients enrolled into the Ultra3Detect study between May 2020 to August 2021.

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