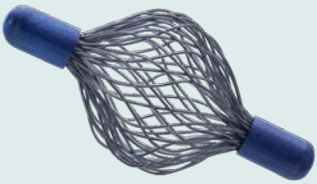
Tumark® Vision Atlas

Case studies

SOMATEX
MEDICAL TECHNOLOGIES

The Tumark® Vision marker is equipped with an ergonomic handle for single-handed operation.



The unique spherical shape leads to high echogenicity especially under ultrasound imaging, regardless transducer position.

Tumark® Vision Atlas

This publication contains case studies of the Tumark® Vision biopsy site marker and provides clinical information

Tumark® Vision – the benchmark for ultrasound visibility

With Tumark® Vision, we have introduced an easy-to-handle biopsy site marker that can be precisely positioned in the soft tissue. The spherical shaped marker is firmly anchored in the tissue and remains visible.

The long-term visibility of a biopsy site marker is particularly important in neoadjuvant chemotherapy. Some of the following case studies report this application scenario.

About us

At SOMATEX®, we design high quality medical products to facilitate diagnoses and therapies. We are closely collaborating with doctors and specialists in the medical fields in order to transfer their requirements into innovative product solutions. Over decades, we have developed into experts for biopsy site marking and wire localization.

SOMATEX
MEDICAL TECHNOLOGIES

Case 1

47 year-old patient with cancer in the right breast

Dr. S. Metz, Institute for Diagnostic and Interventional Radiology at the Technical University of Munich, Klinikum Rechts der Isar, Munich, Germany

Case description

A tomosynthesis (figure 1) of a 47 year-old patient without clinical symptoms shows a lesion with surrounding architectural distortion. The ultrasound shows a correlating hypoechoic lesion. After an ultrasound-guided punch biopsy was performed (figure 2), a clip marker was positioned with Tumark Vision. Histological finding – Infiltrate of a moderately differentiated, invasive cancer of the ductal type/NST, as well as a small-lesion lobular neoplasia (LIN II). Tumor biology – Estrogen receptor: positive (100%); Progestin receptor: positive (100%); HER2/neu: moderate expression (score 2+). FISH negative.

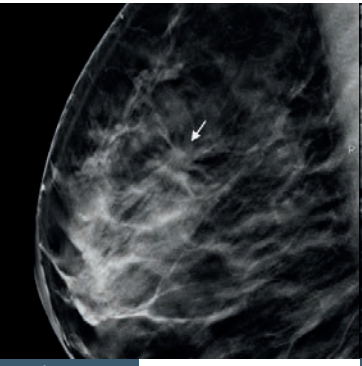


Fig. 1

Tomosynthesis-level image shows lesion with surrounding architectural distortion.

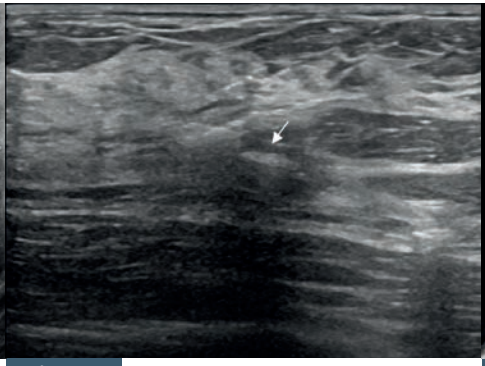


Fig. 2

Breast cancer shown as a hypoechoic lesion and the clip within (not yet expanded), directly after the procedure.

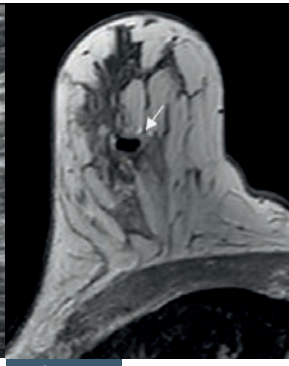


Fig. 3

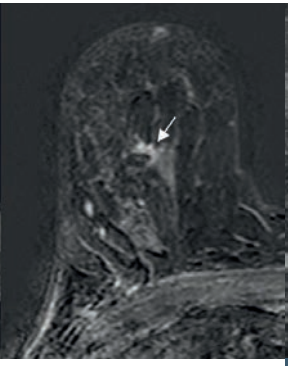
Susceptibility artifact due to the clip in the T1-w dynamic subtraction. Examination performed approximately two weeks after clip procedure and a few days pre-surgery.

Course of treatment

A pre-operative MRI shows the susceptibility artifact due to the clip (3). A segment excision (SE) was performed following the pre-operative ultrasound-guided wire marking (figure 4). Sample radiography (figure 5).

Conclusion

Good ultrasound visibility of the expanded clip in the hypoechoic tumor. Also, depiction of the mammographic and MR tomographic clip properties. Successful resection following pre-operative ultrasound-guided fine needle marking (FNM) of the tumor/clips.



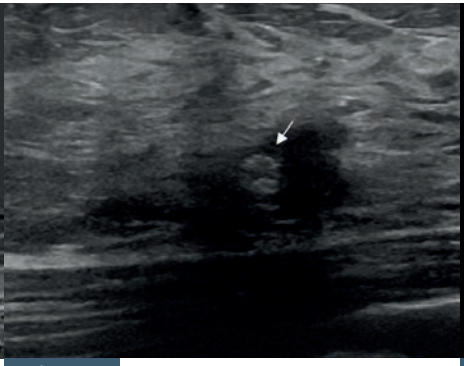


Fig. 4

Good ultrasound visibility of the expanded clip in the hypoechoic tumor prior to FNM.

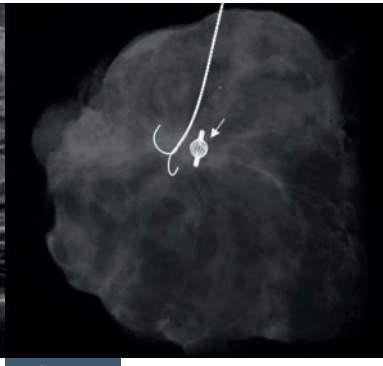


Fig. 5

Mammographic depiction of the clip.

Case 2

Invasive ductal carcinoma in a 49 year-old patient

Prof. Dr. Katja C. Siegmann-Luz, Diagnostisches Brustzentrum Königs Wusterhausen, Germany

Case description

The patient presented with a new, three week old palpable finding in the right breast. Normal findings in the screening of dense glandular tissue and for macromastia. Ultrasound shows a malignoma-typical lesion, 24mm in diameter, in the top right at 12 o'clock, BI-RADS 5. Poorly differentiated triple-negative breast cancer NST G3 confirmed by ultrasound-guided punch biopsy. The lesion is marked with Tumark Vision (figure 1) with ultrasound guidance prior to neoadjuvant chemotherapy. A tumor, 26mm in diameter, surrounding the clip is differentiated in post-intervention breast tomosynthesis (figure 2).

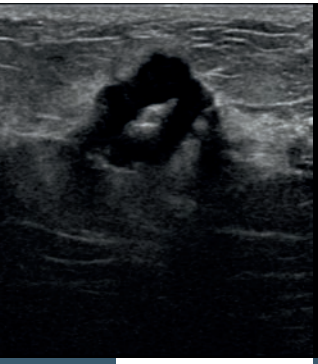


Fig. 1

Ultrasound depiction of Tumark Vision within the cancerous lesion measuring 24mm prior to the planned neoadjuvant therapy.

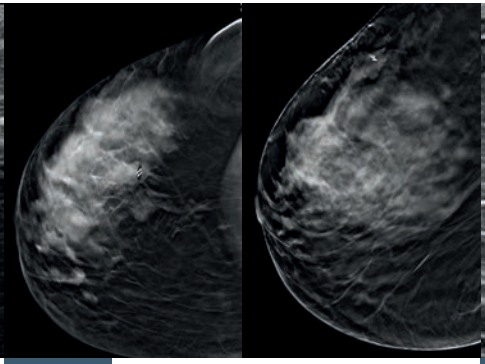


Fig. 2

Breast tomosynthesis right CC (left) and right ML (right), showing the clip (Tumark Vision) within the cancerous lesion measuring 26mm at the right top.

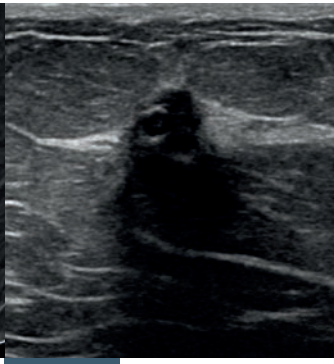


Fig. 3

Breast ultrasound after six months of neoadjuvant chemotherapy, showing Tumark Vision within the residual cancer, measuring 10mm after partial remission.

Course of treatment

Ultrasound check-up after six months of neoadjuvant therapy shows partial remission of the tumor and an unchanged position of Tumark Vision (figure 3). Ultrasound-guided, pre-operative wire marking of the clip (figure 4), clearly visible in the segment resectate (figure 5). Tissue margins are tumor-free (R0).

Conclusion

Long-term ultrasound visibility of the placed clip is helpful in planned breast-conserving surgery (BCS) after neoadjuvant therapy, especially in the case of tumor remissions and if distinguishing of the tumor is limited. Thanks to its geometry, Tumark Vision can be easily distinguished as a hyperechoic ring-shaped structure.

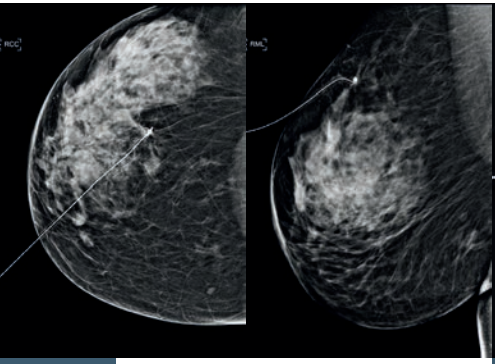


Fig. 4

Mammography right ML (left) and CC (right) images to monitor wire positioning after ultrasound-guided marking of Tumark Vision.

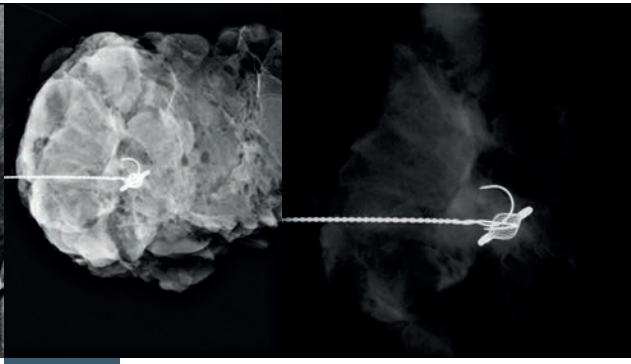


Fig. 5

Sample radiography. Diagnostic exposure (left), magnification of the raw image to show Tumark Vision (right).

Case 3

A 45 year-old patient with right-axillary lymph node suggestive of metastasis detected in ultrasound

Dr. S. Metz, Institute for Diagnostic and Interventional Radiology at the Technical University of Munich, Klinikum Rechts der Isar, Munich, Germany.

Case description

A right-axillary lymph node, suggestive of metastasis, was detected in an ultrasound. Initially, an ultrasound-guided punch biopsy of the lymph node detected cancerous cells. PET-CT and breast MRI for staging followed. Second ultrasound and sonobiopsy of the inside-right of the breast: NST, G3, HR negative; HER2-immunohistochemistry: 3+.

Course of treatment

The primary tumor and right-axillary lymph node clip marked with Tumark Vision. Primary systemic therapy initiated, consisting of 4 x

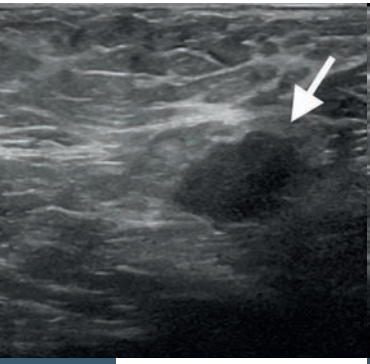


Fig. 1

The primary lymph node metastasis is indicated by the arrow.

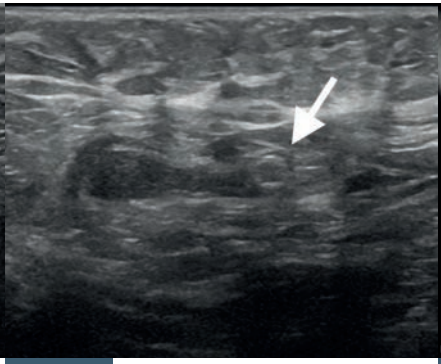


Fig. 2

Following primary systemic therapy (PST), images show the complete remission (CR) of the metastasis, the lymph node's inconspicuous morphology, the clip (Tumark Vision) indicated by the arrow, in a regular position, highly visible in the ultrasound.

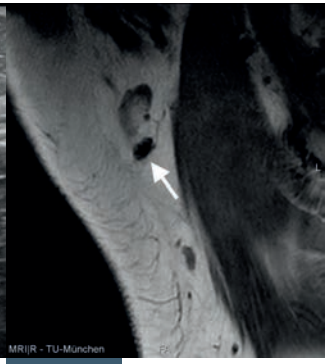


Fig. 3

MRI corT1-w native to the right axilla; following PST.

EC followed by 12 x trastuzumab + pertuzumab weekly. Following primary systemic therapy (PST), complete remission (CR) shown in the imaging.

Conclusion

A treatment option analogous to the course of action suggested in the SenTa study would be a suitable option for the case presented. The hospitals "Kliniken Essen-Mitte" (Kümmel S. et al.) have initiated this study, which is a prospective, multi-centric registry on the usage frequency and feasibility of targeted axillary dissection in patients with primary breast cancer and PST, in whom a punch biopsy is initially performed and the clinically suspicious lymph node is marked with a clip.

The primary study goal defined is the identification of the surgical detection rate of the target lymph node (TLNB) marked with a clip. In this context, distinguishing of the clip via ultrasound for pre-operative marking is of crucial importance.

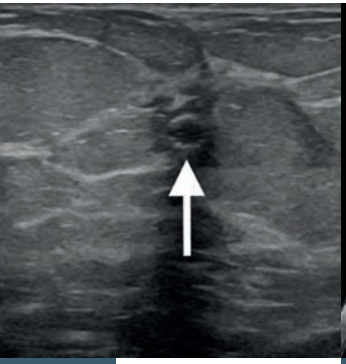


Fig. 4

Ultrasound of the (former) inside-right of the breast tumor, the clip (Tumark Vision) is clearly distinguished by the arrow. Five months after the initiation of primary systemic therapy (PST).

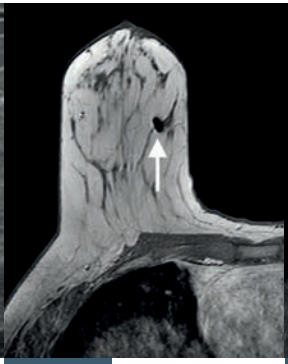


Fig. 5

MRI axialT1-w of the right breast shows the susceptibility artifact inside due to the clip (Tumark Vision), indicated by the arrow.

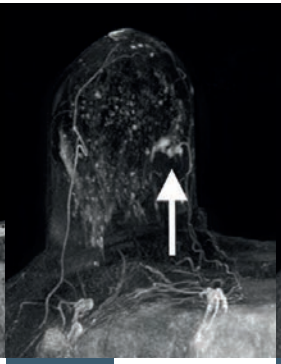


Fig. 6

MRI as axial maximum intensity projection (MIP) of the first subtraction. Prior to PST with the occult primary tumor inside-right up to this point, is indicated by the arrow.

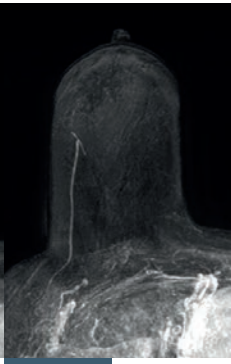


Fig. 7

MRI as axial MIP of the first subtraction. Image shows CR after PST.

Case 4

A 37 year-old patient with invasive ductal cancer

Prof. Dr. Jörg Heil, Universitäts-Frauenklinik Heidelberg, Germany

Case description

The patient presented in February 2017 for an evaluation of an unclear finding in her left breast that was discovered during a screening session. Mammographic evidence of a lesion was found in two levels in the imaging, on the left side at 1 o'clock, extending to over 11 x 10mm in size, ACR 3, BIRADS 5. Ultrasound evidence of an unclear and suspicious lesion on the left at 1 o'clock position, extending to over 10 x 10 x 11 mm in size, BIRADS 5. An ultrasound-guided punch biopsy result is a moderately differentiated HER2 phenotype breast cancer NST G2.

Prior to neoadjuvant chemotherapy, ultrasound-guided lesion marking was performed with Tumark Vision (figure 1).

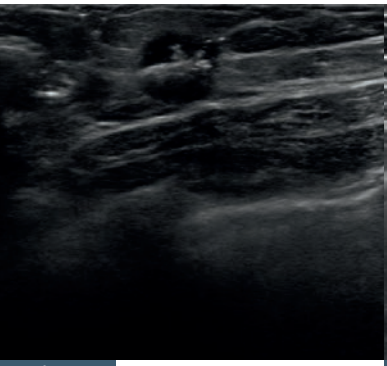


Fig. 1

Ultrasound depiction of the Tumark Vision within the cancerous lesion immediately after marking and before NACT initiation.

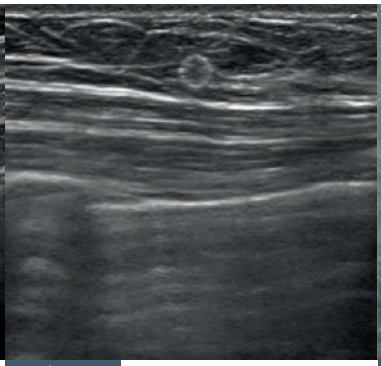


Fig. 2

Ultrasound depiction of the Tumark Vision two months after marking and after two NACT cycles. Finding cannot be clearly differentiated (anymore). Marker within the tumor bed. .

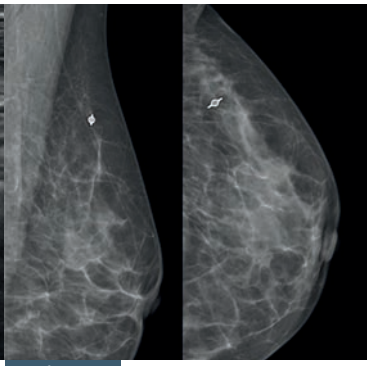


Fig. 3

Mammography left ML (left image) and CC (right image) two months after marking following two NACT cycles. Finding cannot be clearly differentiated (anymore), marker within the tumor bed.

Course of treatment

During ultrasound and mammography follow-ups carried out at two, three and five months after marking, the clipmarker was clearly visible in the ultrasound and mammographic imaging within the tumor bed (figures 2-6) in a finding no longer clearly distinguishable.

Upon completion of NACT consisting of 6 x TCbHP, segment resection with ALND was performed. After sample radiography and radiological examination (confirmation with a mammography), a second resection, medio-cranial, was recommended and performed. In sample radiography, the Tumark Vision was clearly visible in the resected segment tissue (figure 8). The histological finding suggests a pathological complete remission (ypT0, ypNo, Lo).

Conclusion

In the case presented, the Tumark Vision was clearly distinguished in the ultrasound scans as a hyperechoic, ring-shaped structure throughout the complete course of neoadjuvant therapy. Due to the limited tumor differentiation, here in complete remission already after the first NACT cycle, long-term dstinguishing of the clip was helpful during follow-ups.

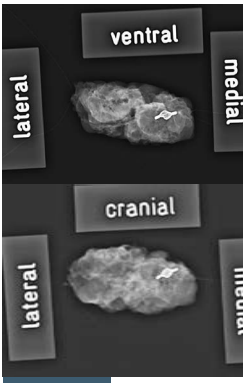


Fig. 7

Sample radiography

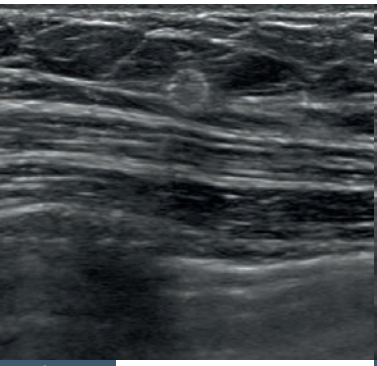


Fig. 4

Ultrasound depiction of the Tumark Vision three months after marking. Finding cannot be clearly differentiated (anymore), marker within the tumor bed.

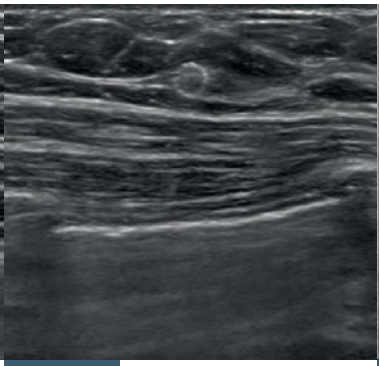


Fig. 5

Ultrasound depiction of the Tumark Vision five months after marking upon completion of NACT (6 x TCbHP). Finding cannot be clearly differentiated (anymore), marker within the tumor bed.

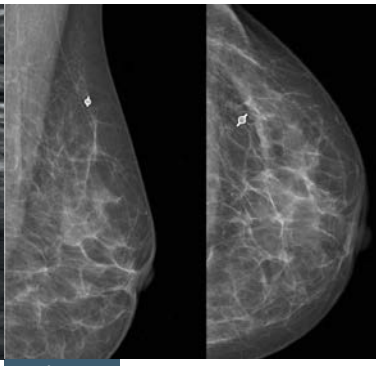


Fig. 6

Mammography left ML (left image) and CC (right image) five months after marking upon completion of NACT (6 x TCbHP). Finding cannot be clearly differentiated (anymore), marker within the tumor bed.

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