# Grundlage der ultraschallgesteuerten Punktion

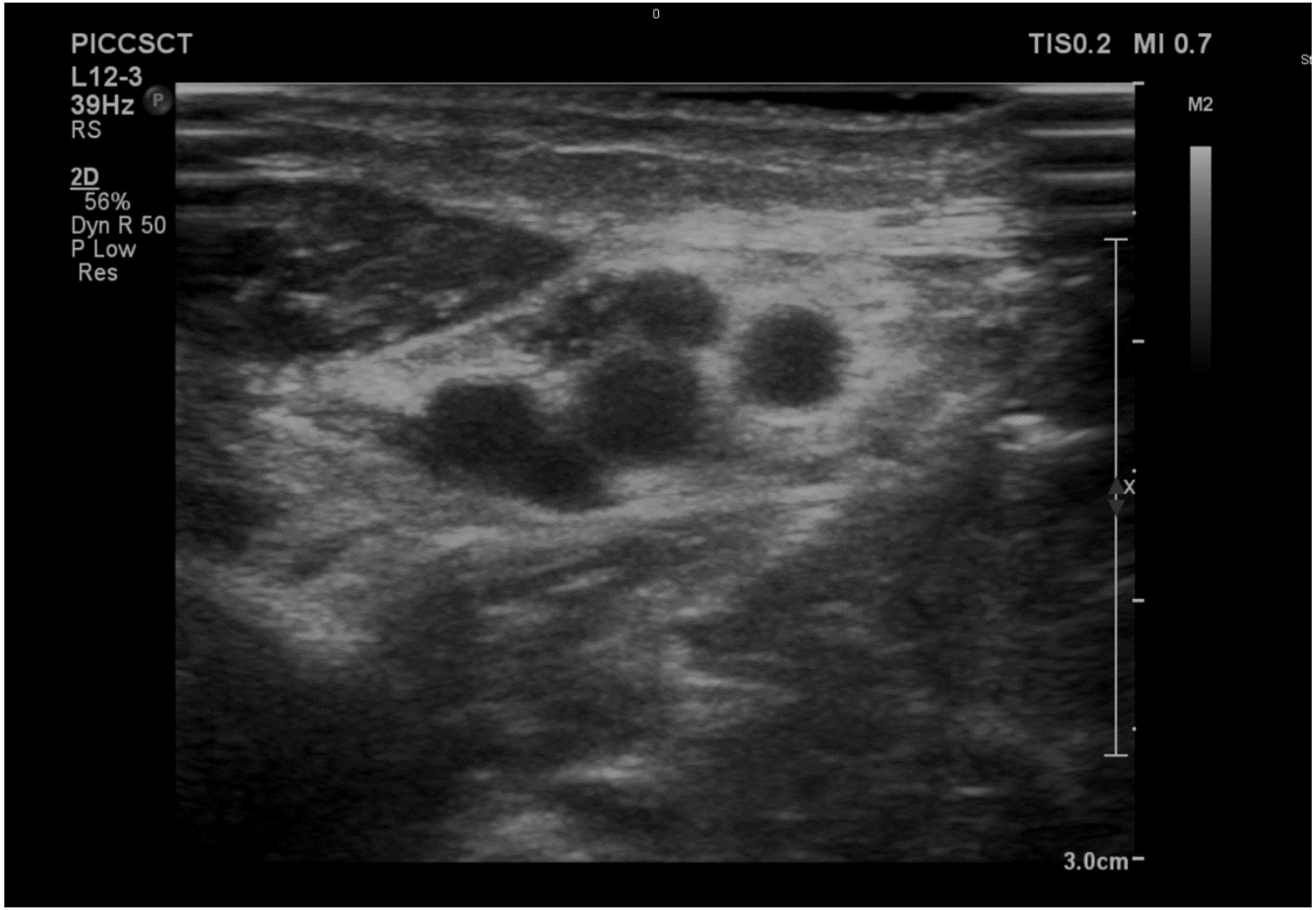
Universitätsspital Basel

**SGUM**
**Duplexsonographie Abschlusskurs**
**25.– 26. März 2024**

**Martin Takes**
**Interventionelle Radiologie**

# Warum sonographisch gesteuert punktieren?

- Nicht sichtbares- oder tastbares Gefäss
- Geringere Wahrscheinlichkeit einer Fehlpunktion und somit eines Hämatoms oder Affektion von Nachbarstrukturen
- Optimale Einstichstelle im Gefäss unter Berücksichtigung von Gefässirregularitäten
- Höherer Patientenkomfort
- schneller



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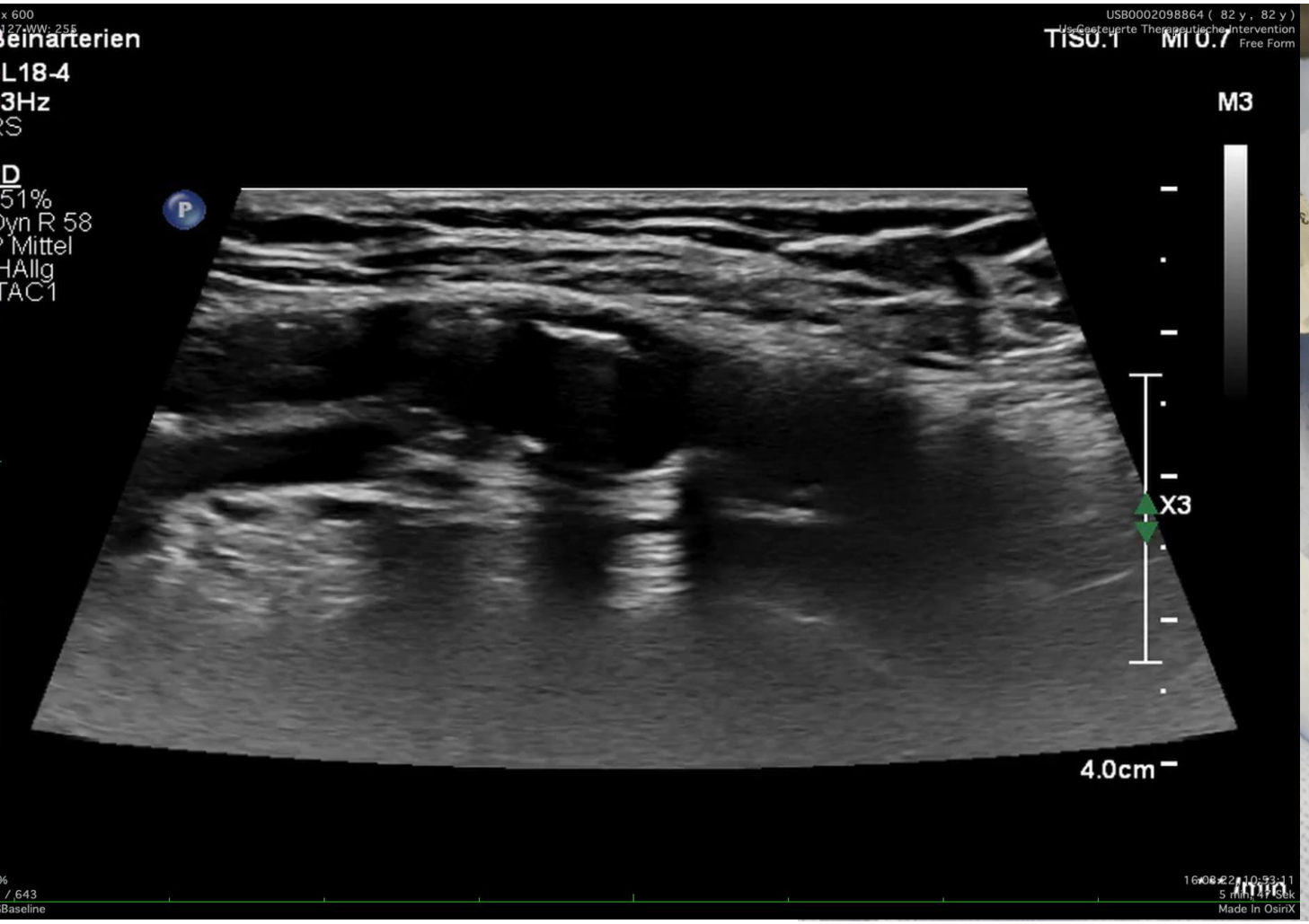


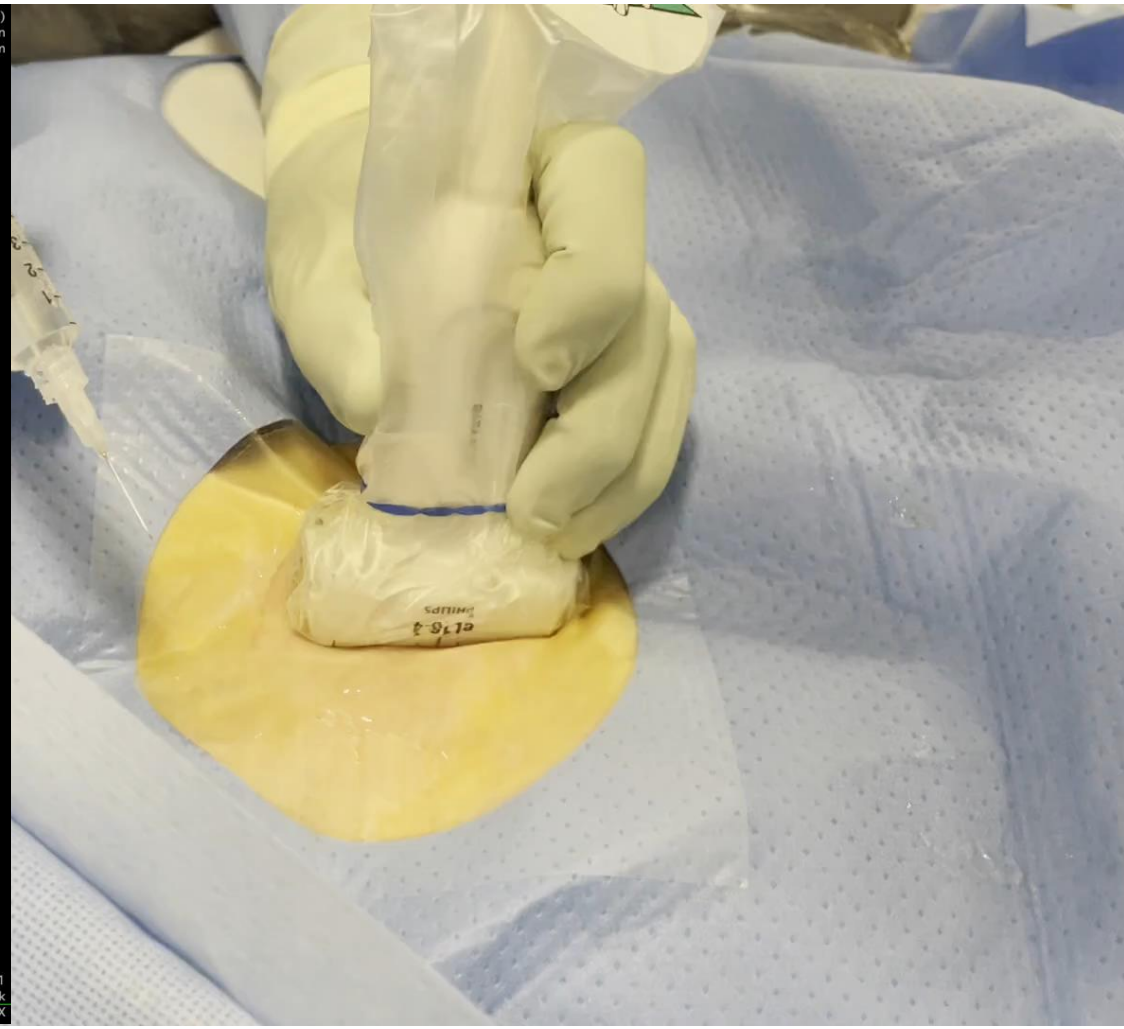



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Randomized Controlled Trial > Ann Emerg Med. 2005 Nov;46(5):456-61.
doi: 10.1016/j.annemergmed.2004.12.026.

# Ultrasonography-guided peripheral intravenous access versus traditional approaches in patients with difficult intravenous access

Thomas G Costantino [1], Aman K Parikh, Wayne A Satz, John P Fojtik

Affiliations + expand

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## Abstract

**Study objective:** We assess the success rate of emergency physicians in placing peripheral intravenous catheters in difficult-access patients who were unsuccessfully cannulated by emergency nurses. A technique using real-time ultrasonographic guidance by 2 physicians was compared with traditional approaches using palpation and landmark guidance.

**Methods:** This was a prospective, systematically allocated study of all patients requiring intravenous access who presented to 2 university hospitals between October 2003 and March 2004. Inclusion criterion was the inability of any available nurse to obtain intravenous access after at least 3 attempts on a subgroup of patients who had a history of difficult intravenous access because of obesity, history of intravenous drug abuse, or chronic medical problems. Exclusion criterion was the need for central venous access. Patients presenting on odd days were allocated to the ultrasonographic-guided group, and those presenting on even days were allocated to the traditional-approach group. Endpoints were successful cannulation, number of sticks, time, and patient satisfaction.

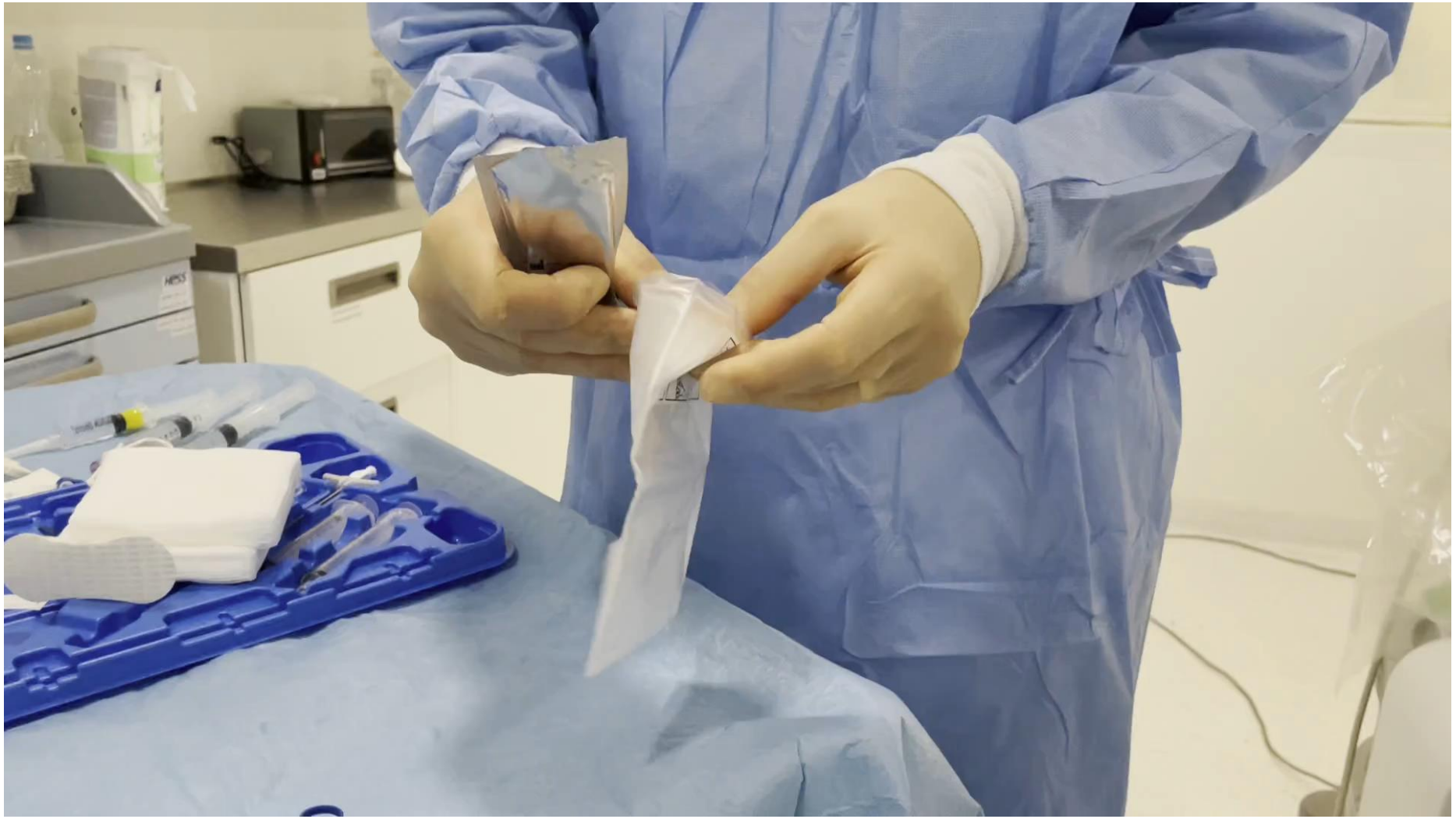
**Results:** Sixty patients were enrolled, 39 on odd days and 21 on even days. Success rate was greater for the ultrasonographic group (97%) versus control (33%), difference in proportions of 64% (95% confidence interval [CI] 39% to 71%). The ultrasonographic group required less overall time (13 minutes versus 30 minutes, for a difference of 17 [95% CI 0.8 to 25.6]), less time to successful cannulation from first percutaneous puncture (4 minutes versus 15 minutes, for a difference of 11 [95% CI 8.2 to 19.4]), and fewer percutaneous punctures (1.7 versus 3.7, for a difference of 2.0 [95% CI 1.27 to 2.82]) and had greater patient satisfaction (8.7 versus 5.7, for a difference of 3.0 [95% CI 1.82 to 4.29]) than the traditional landmark approach.

**Conclusion:** Ultrasonographic-guided peripheral intravenous access is more successful than traditional "blind" techniques, requires less time, decreases the number of percutaneous punctures, and improves patient satisfaction in the subgroup of patients who have difficult intravenous access.

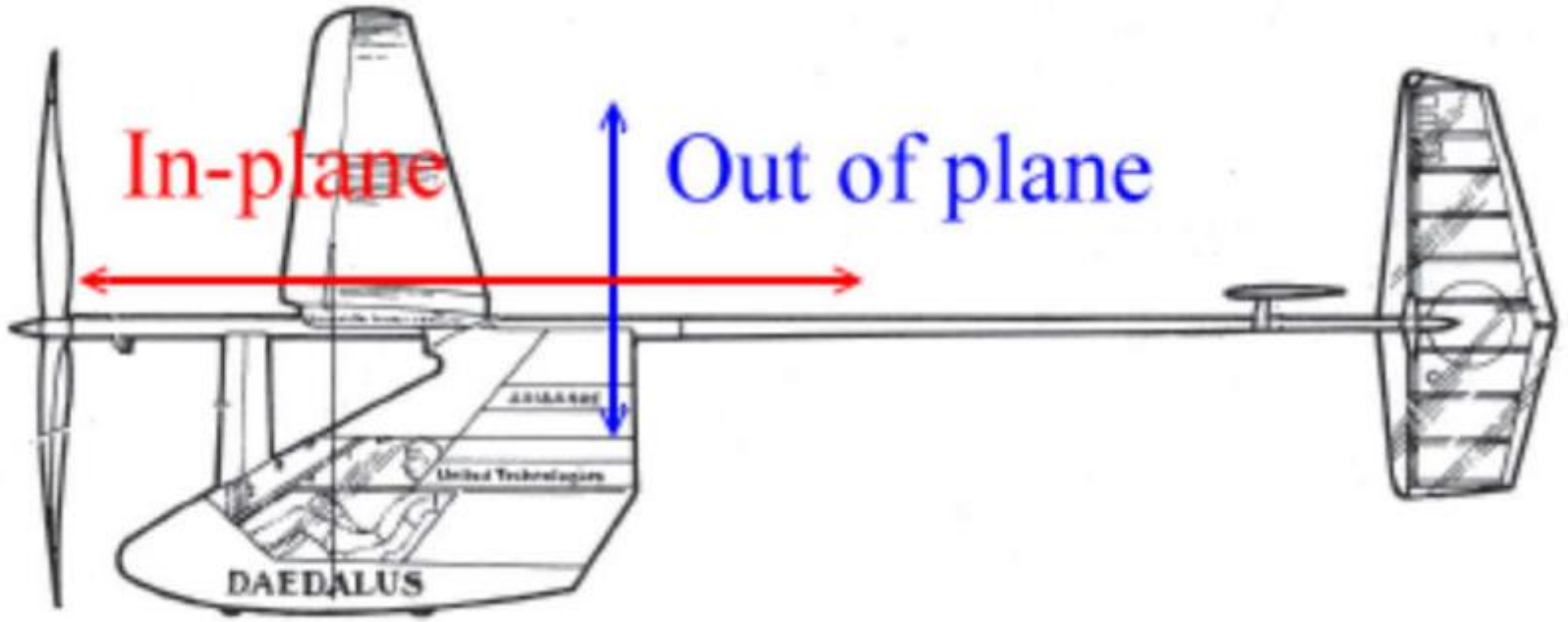
# Vorbereitung

- Einstellungen am Ultraschall vor Punktion durchführen
- Aufsuchen des Gefässes und Ausrichten des Schallkopfes entlang des Gefässverlaufs
- Erkennen von gefährdeten Strukturen (Nerven, Arterien)
- Sterilität beachten

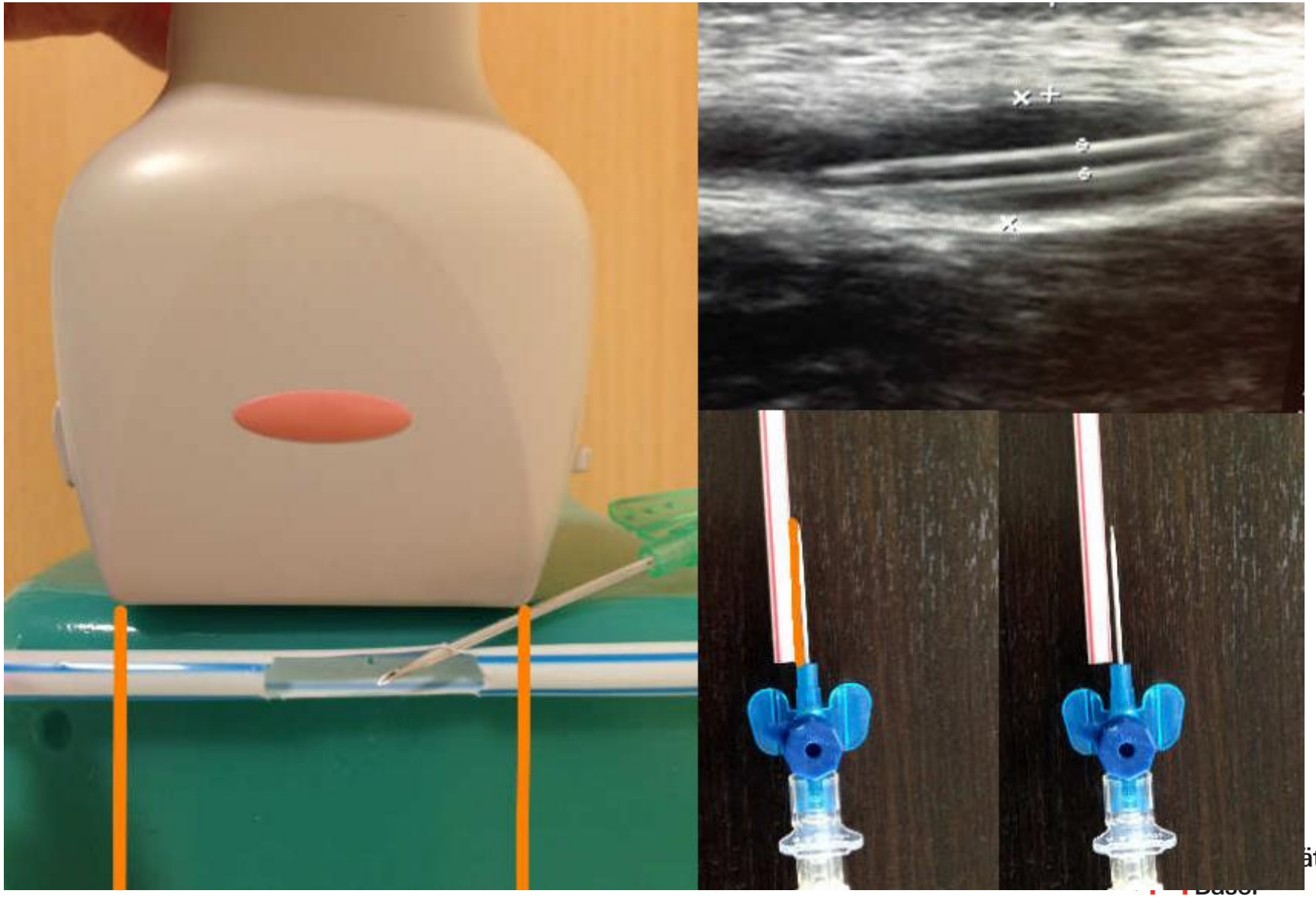
# Einpacken Sonokopf



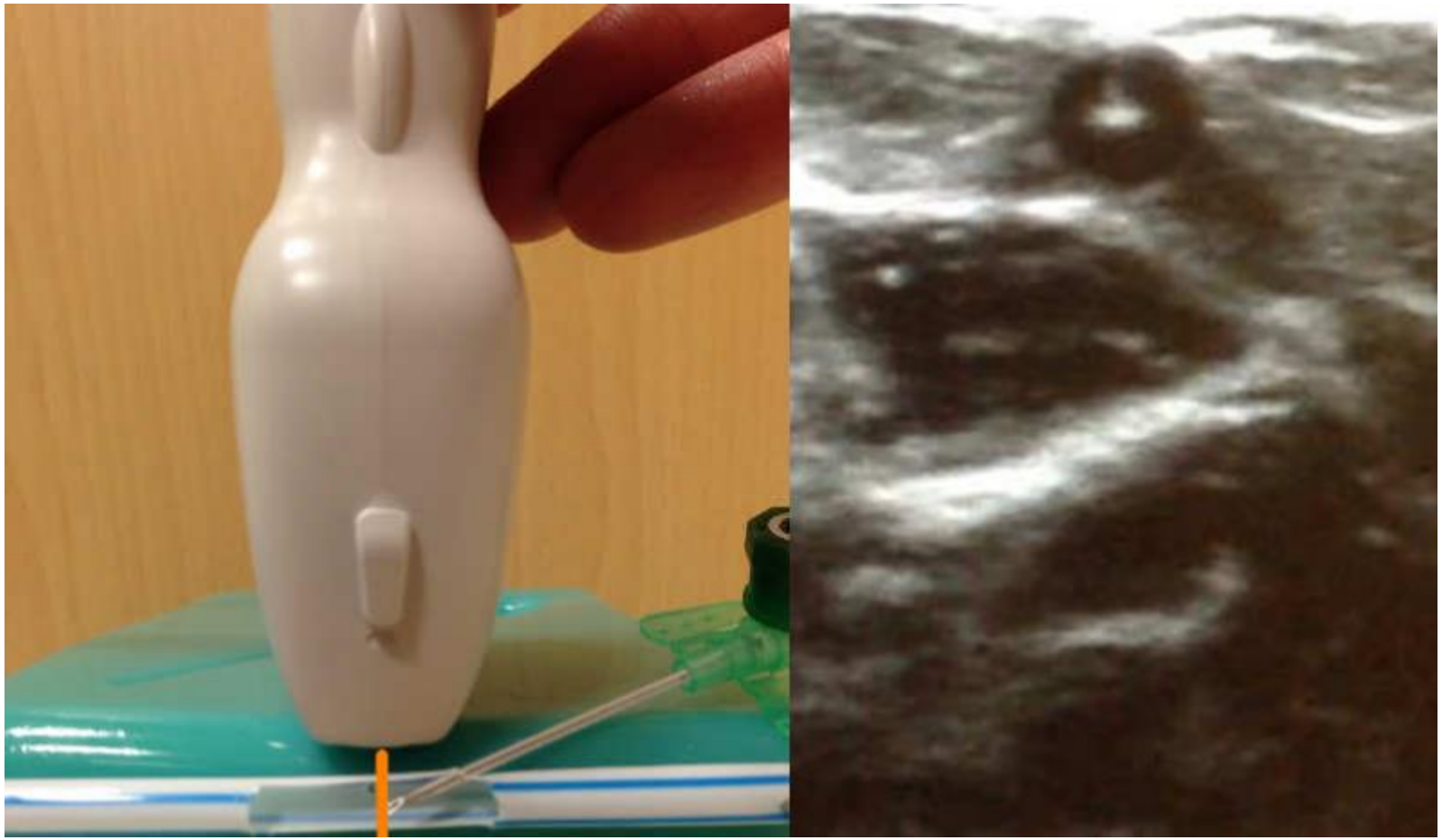
# Mögliche Schallkopfausrichtung



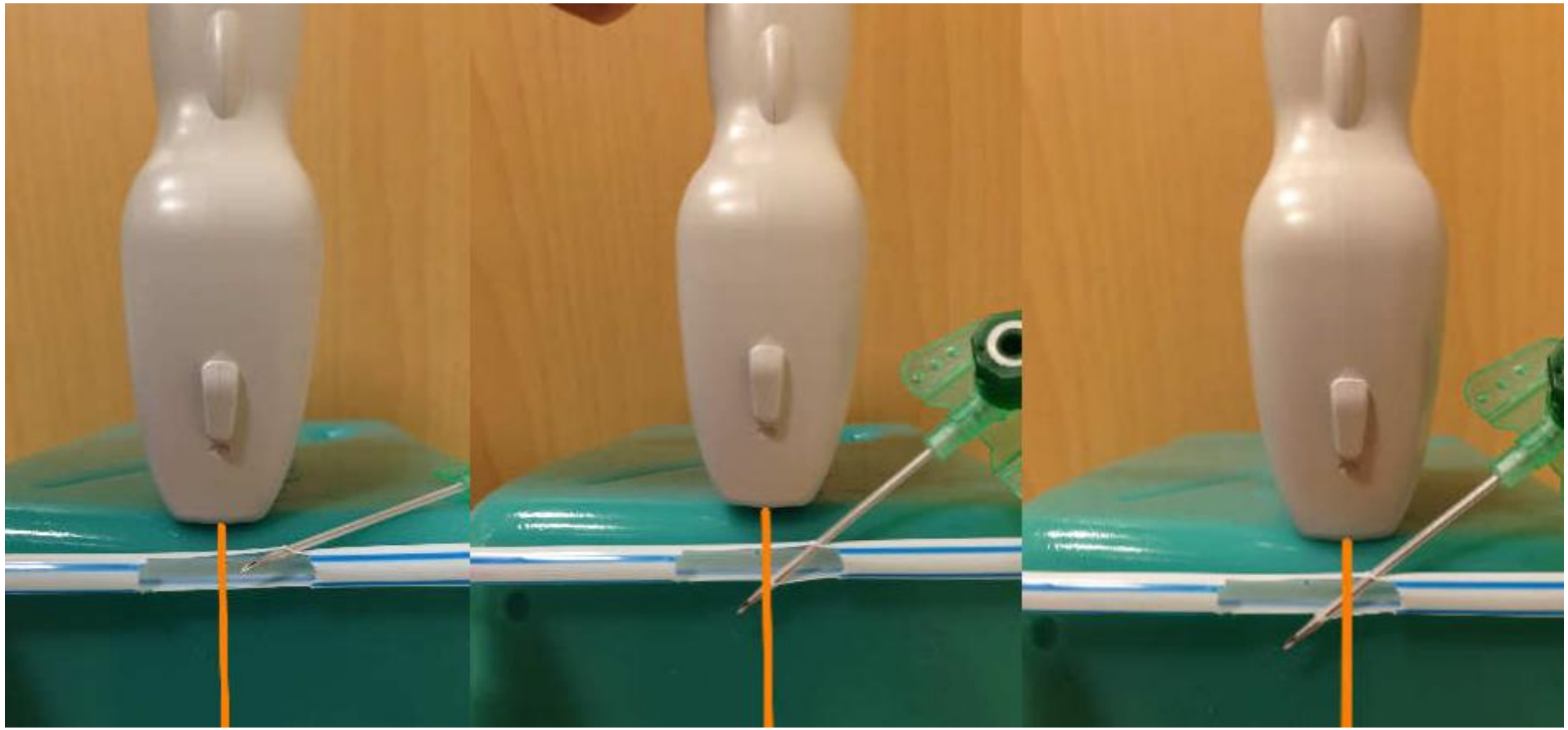
# Punktion in plane



# Punktion out of plane



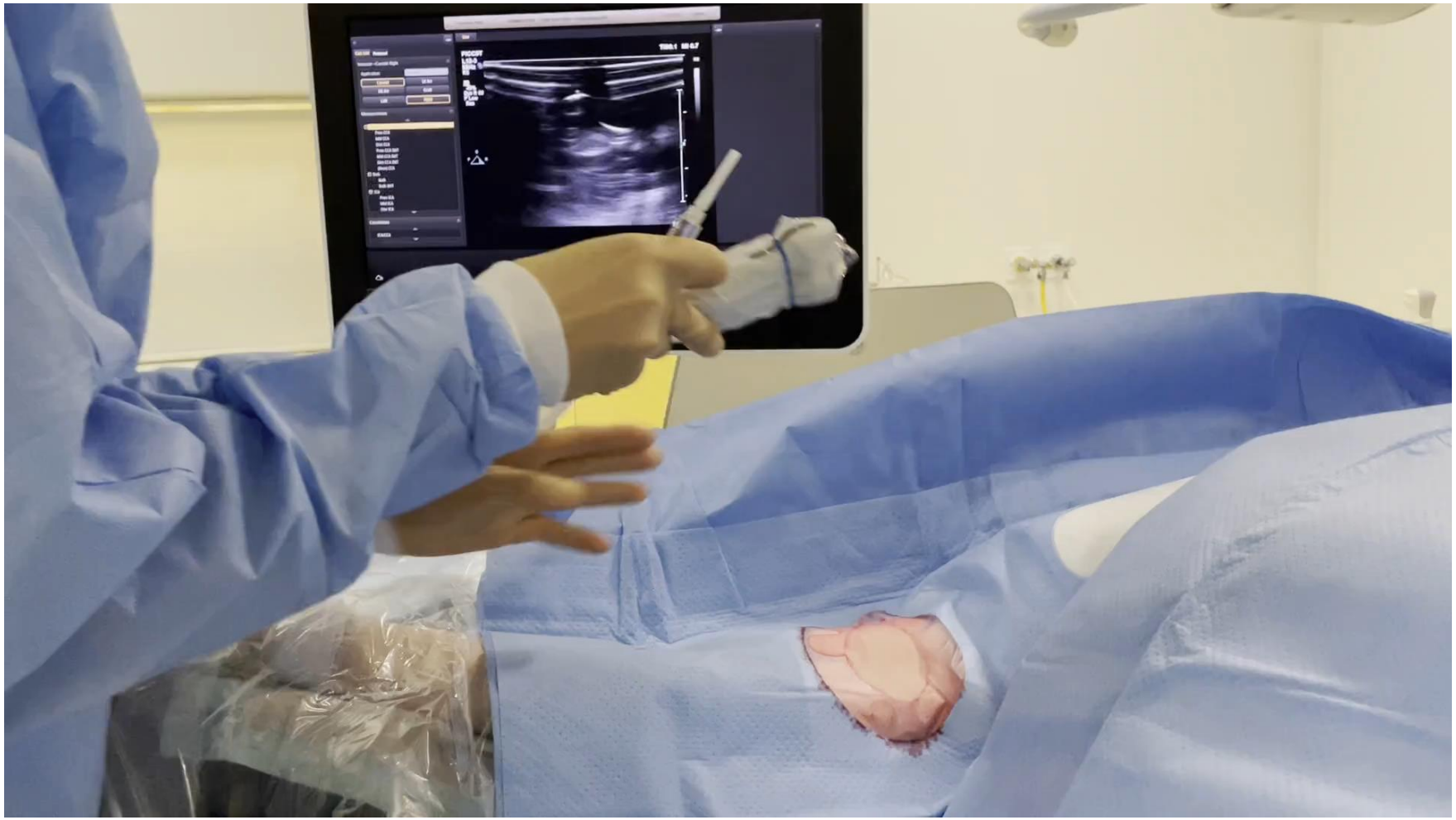
# Problematik out of plane



# Punktion out of plane

- Auf die Spitze der Kanüle achten
- Positionierung des Schallkopfes ungefähr über der geplanten Eintrittsstelle im Gefäss
- Durch Kippen des Schallkopfes die Nadelspitze subcutan abholen und verfolgen bis zum Gefäss
- Nach Punktion in das Lumen noch ein paar mm weiter die Nadel zentral im Lumen vorbringen, dafür Nadelspitze horizontal zum Gefäss ausrichten

# Venöse Punktionen



# Video PICC Sonopunktion

# Video: sonopunktion picc

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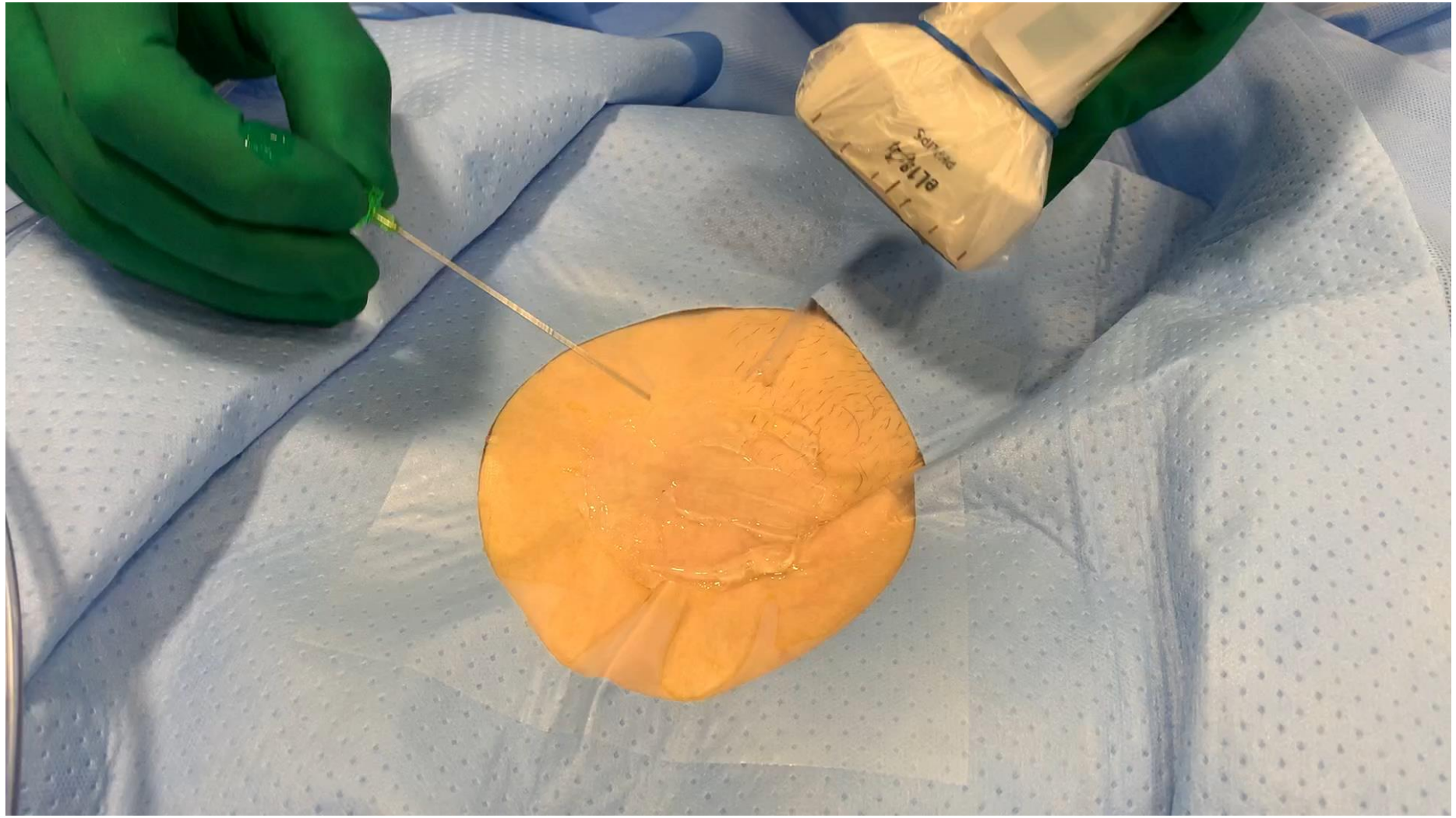
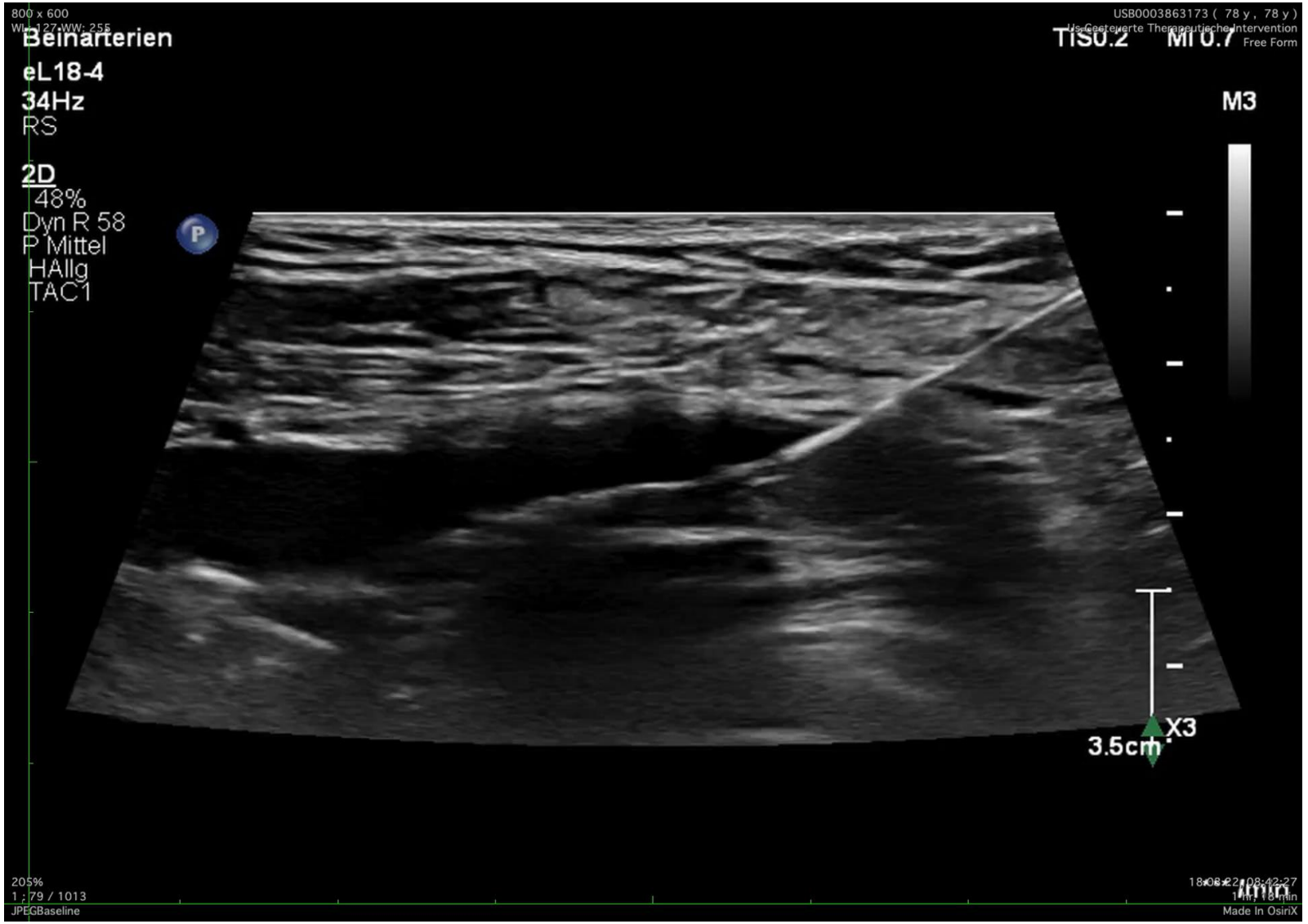
# Arterielle Punktion
# Das Beste aus beiden Welten

- Zunächst in plane bis zum Gefäss
- Anschliessend out of plane in das Gefäss



# Video sonogest. Sondierung 18.3.22



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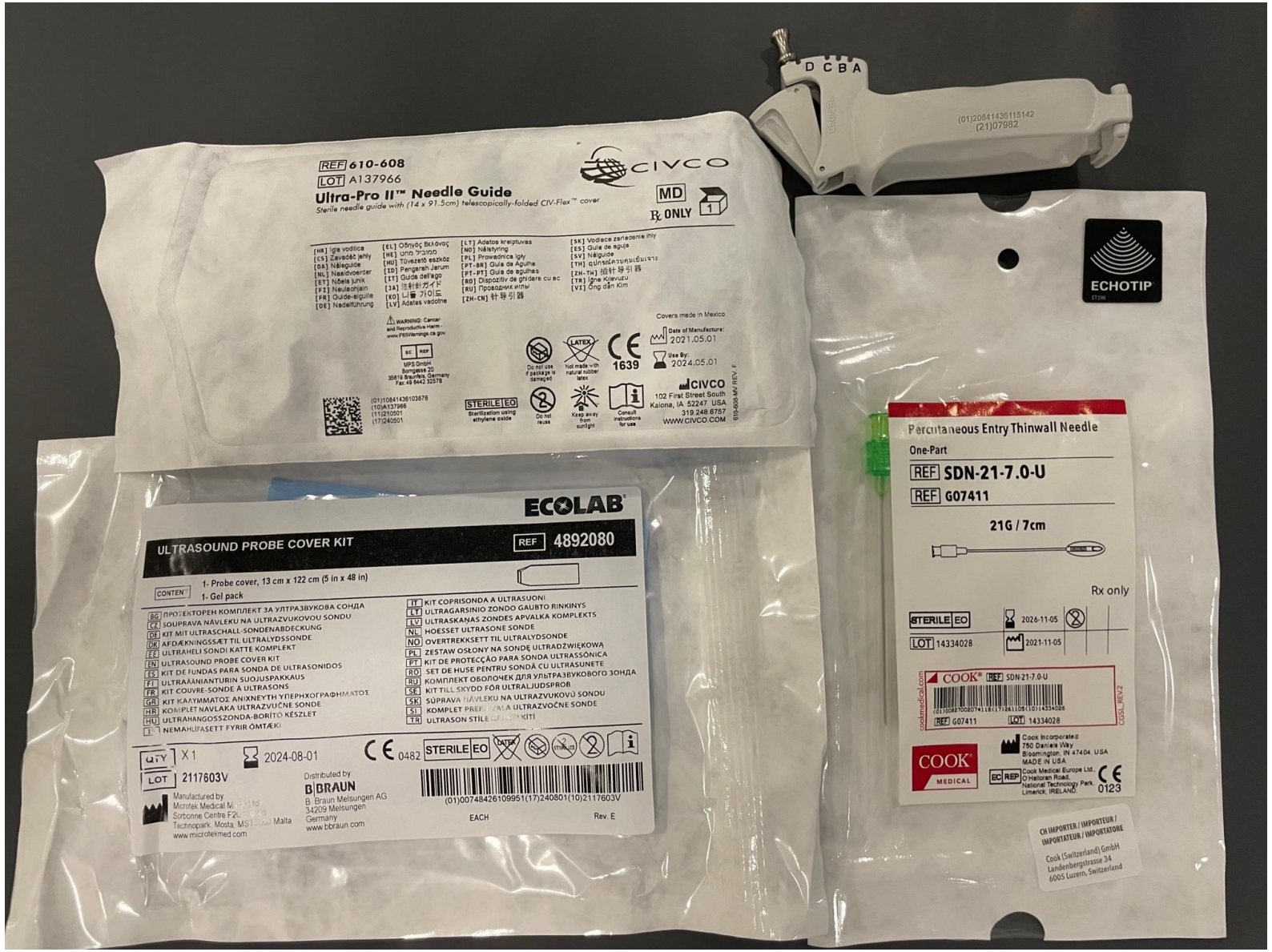
# Nützliches



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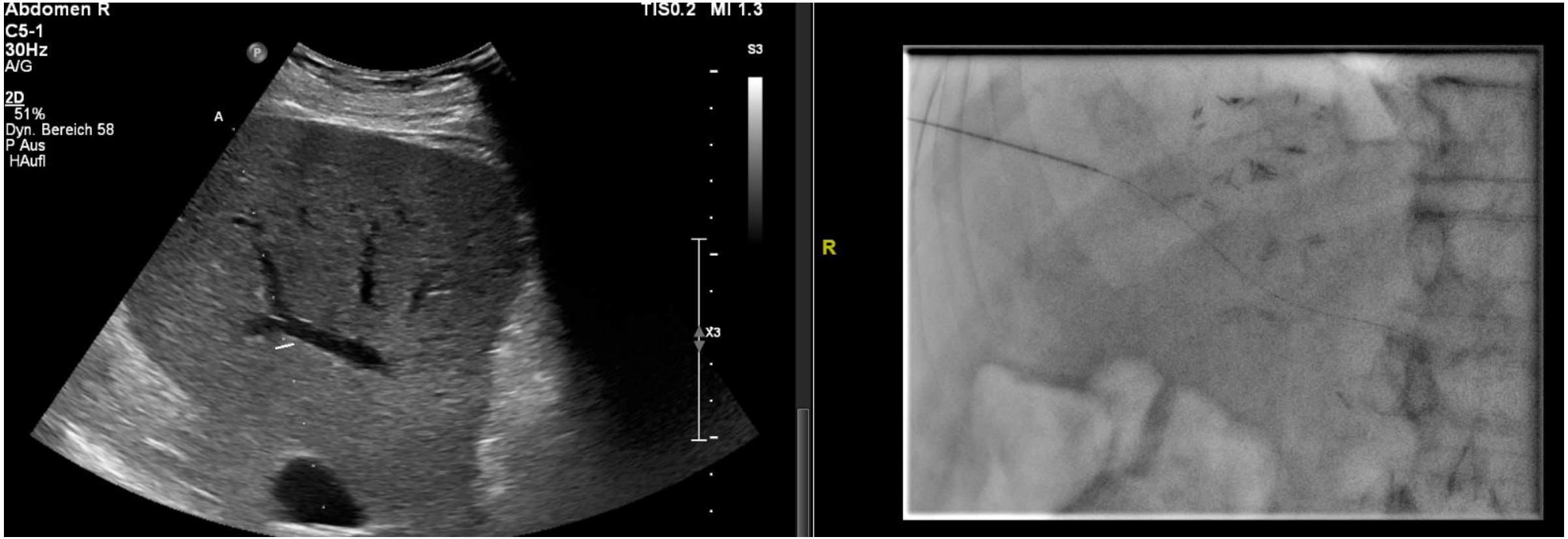
# Tipps

- Nadellänge beachten
- Echogenität durch Aufkratzen der Nadelspitze verbesserbar
- Wackeln an der Nadel erleichtert Auffinden
- Wenn Nadel nicht mehr sichtbar nicht die Nadelposition verändern, sondern den Schallkopf entsprechend ausrichten
- Ganz horizontaler Verlauf und sehr oberflächlich ist schwerer einzustellen
- Übung macht den Meister

# Sonographisch gesteuerte Punktionen fortgeschritten

- Organbiopsien
- Einlage von Ernährungssonden
- Radiofrequenzablation in moving shot Technik

# needle guide



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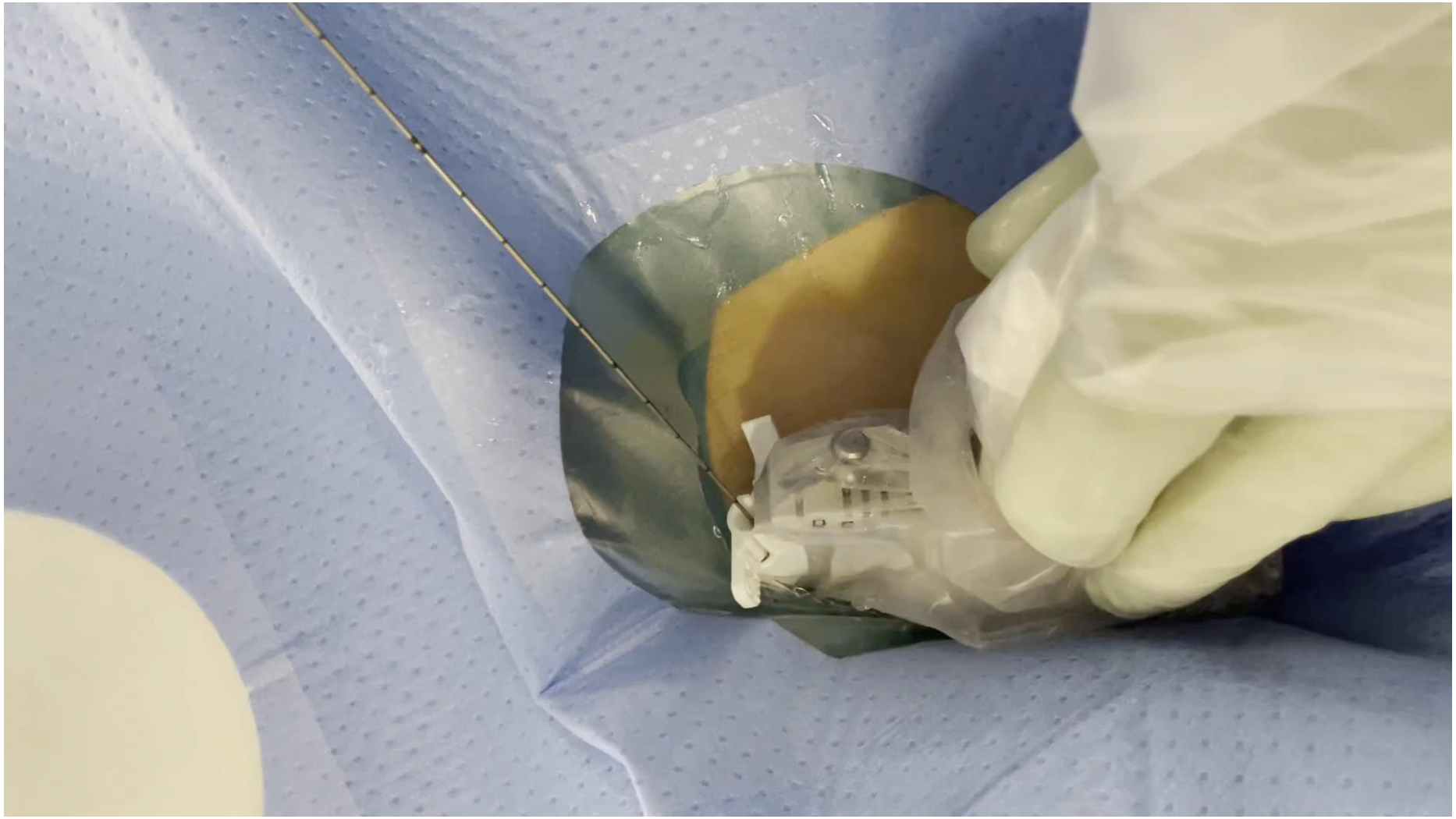

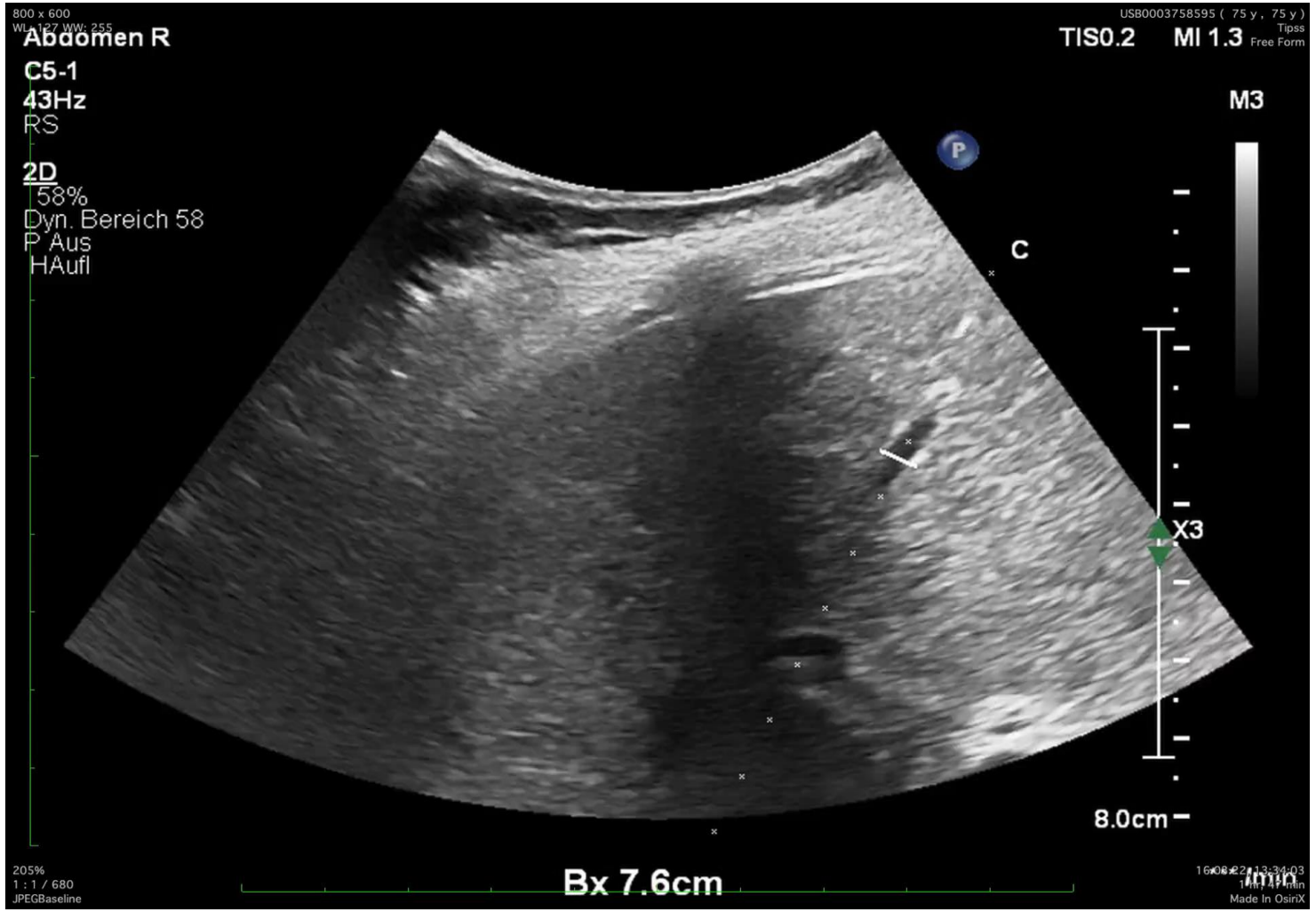




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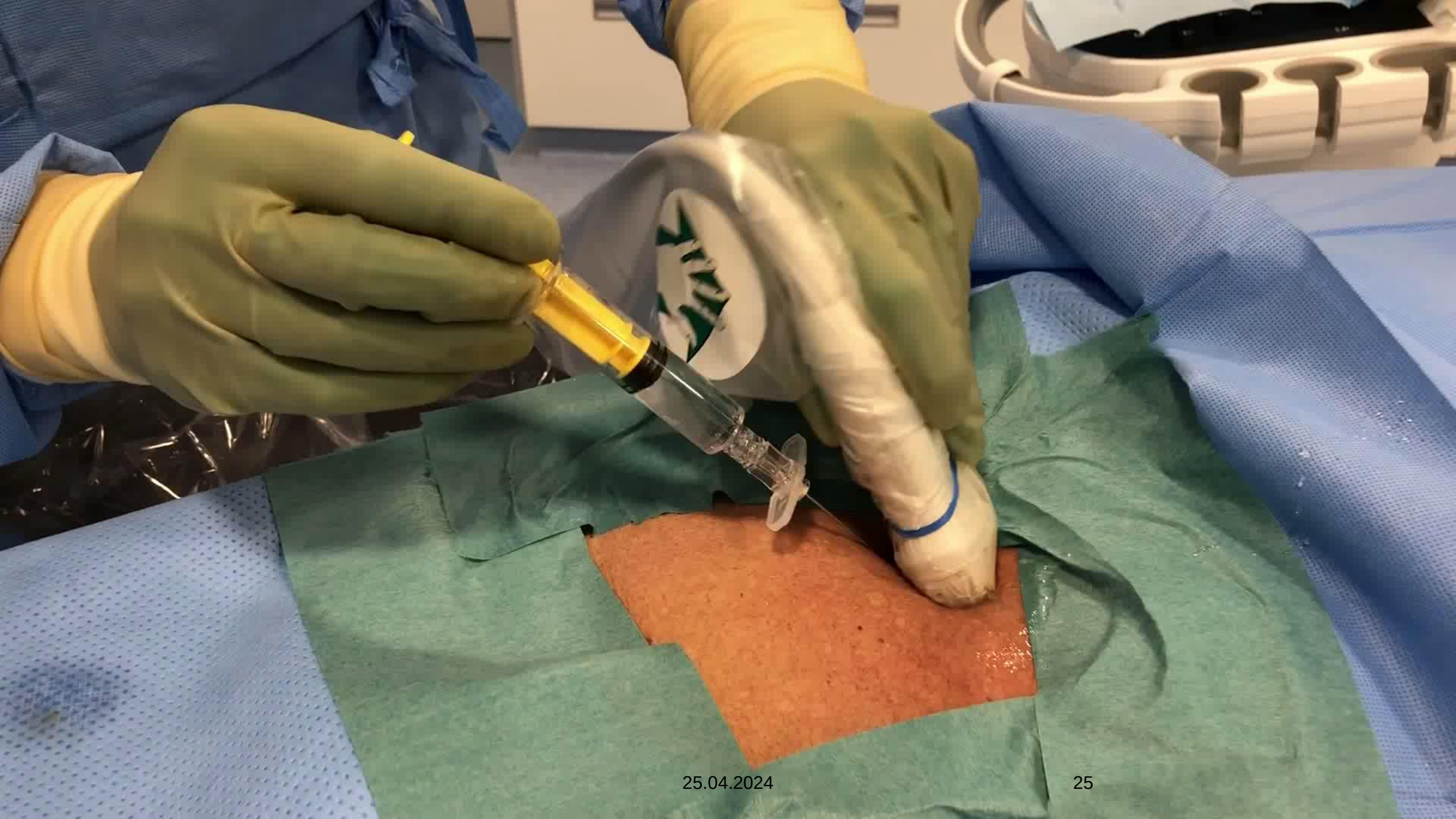


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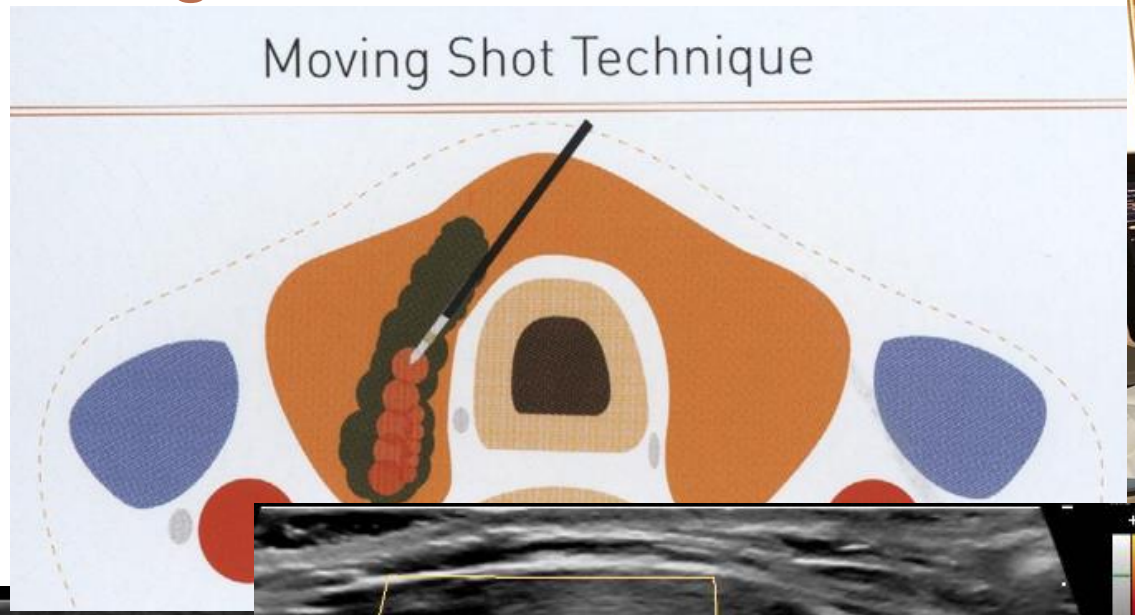
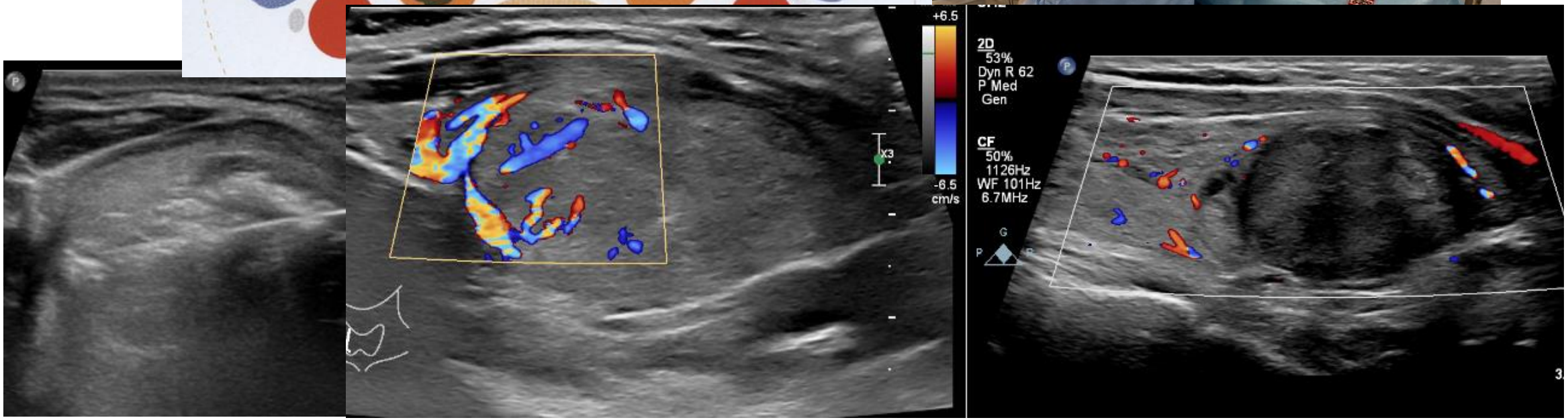
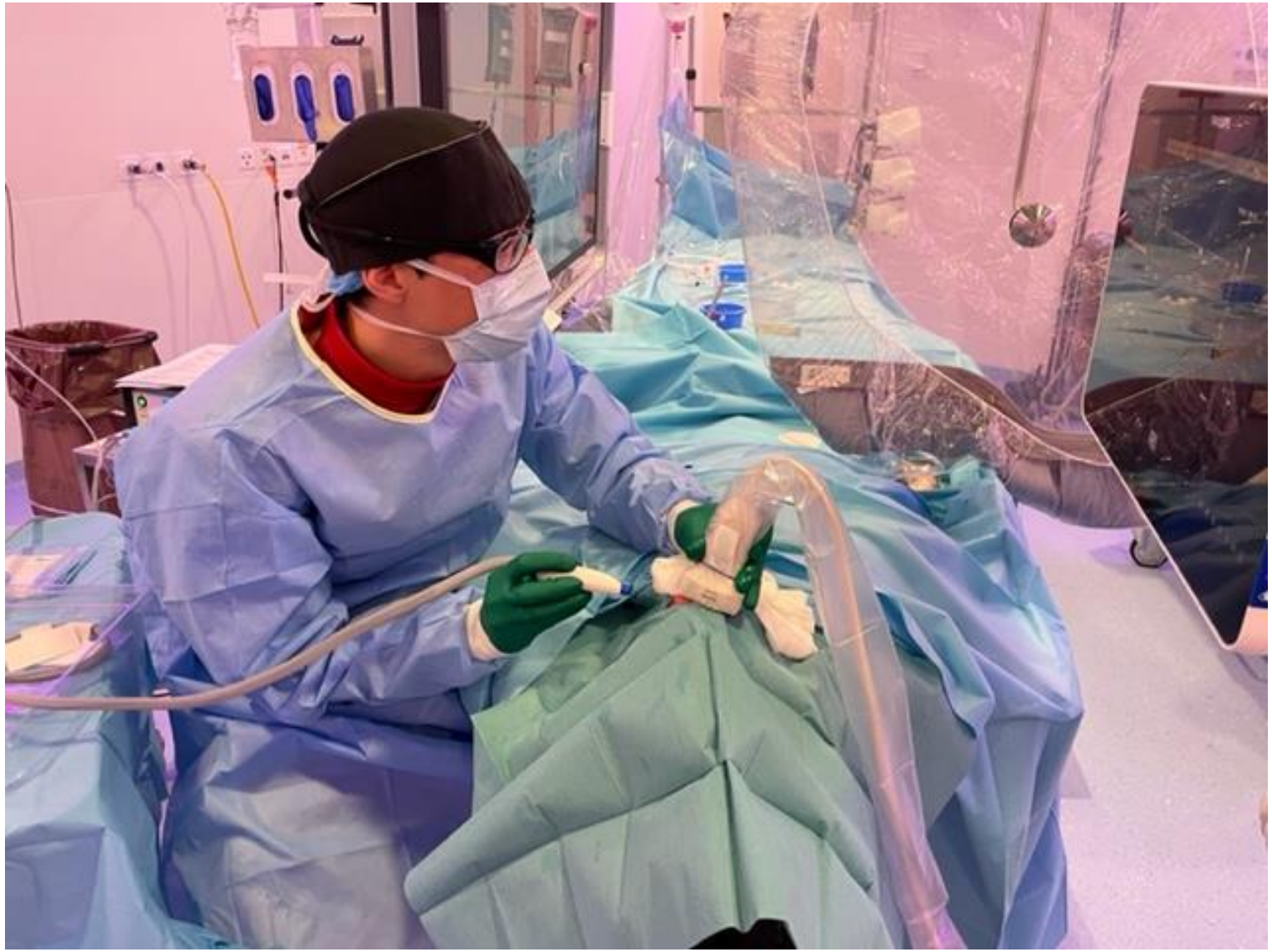
# Behandlung Schilddrüsenknoten



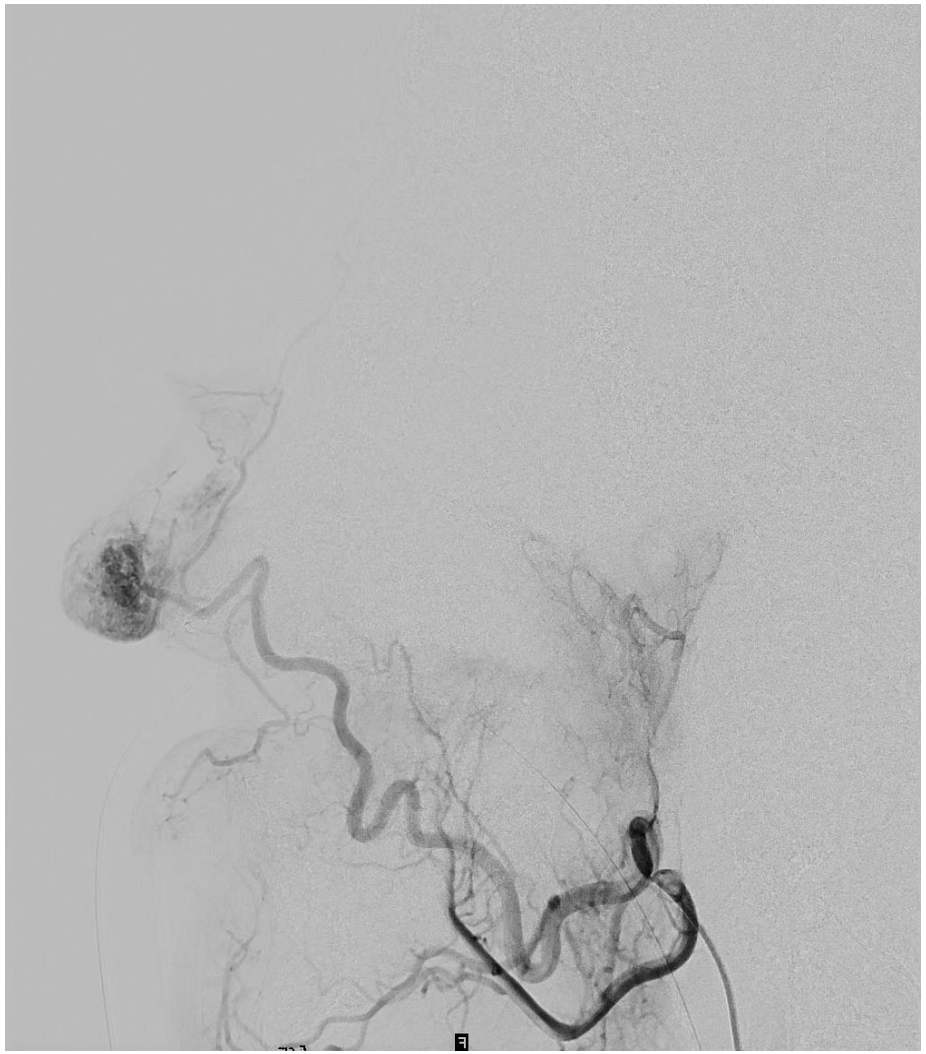



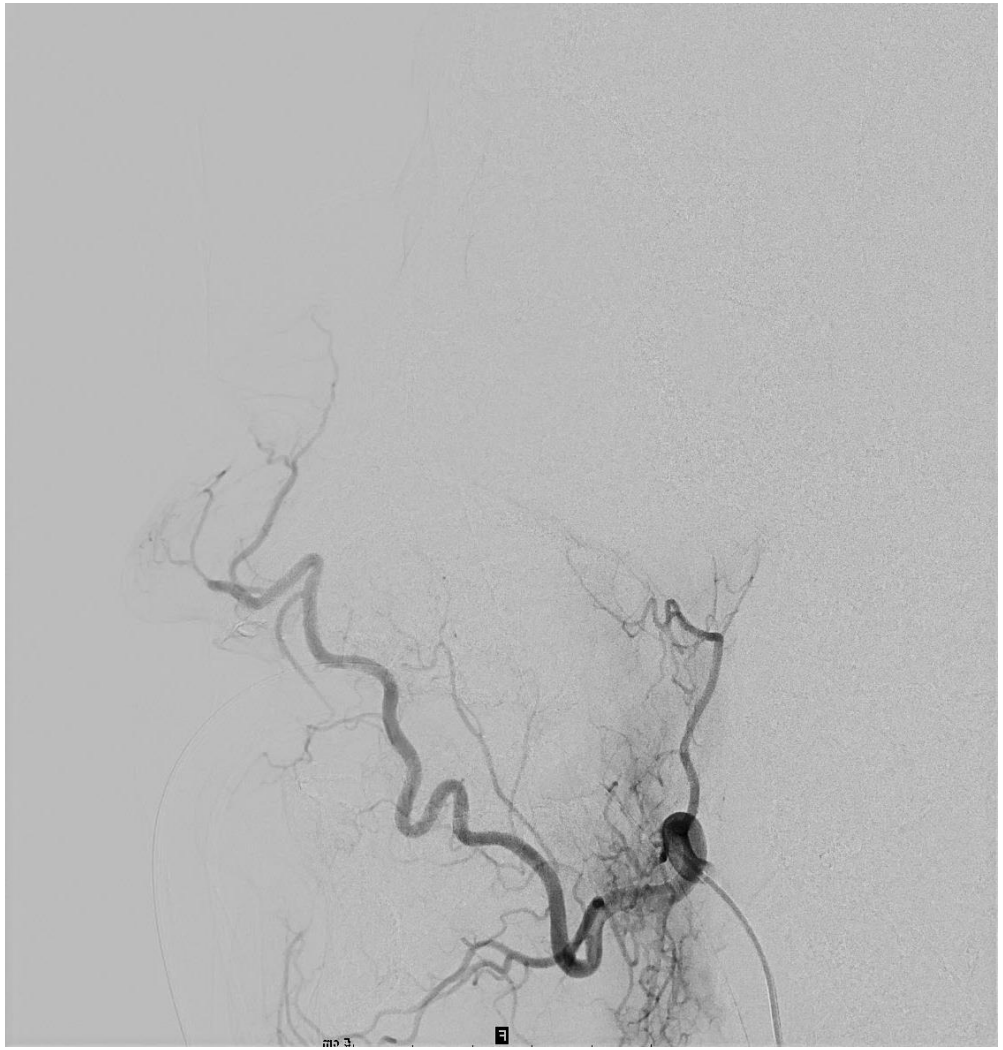
# Behandlung AVM

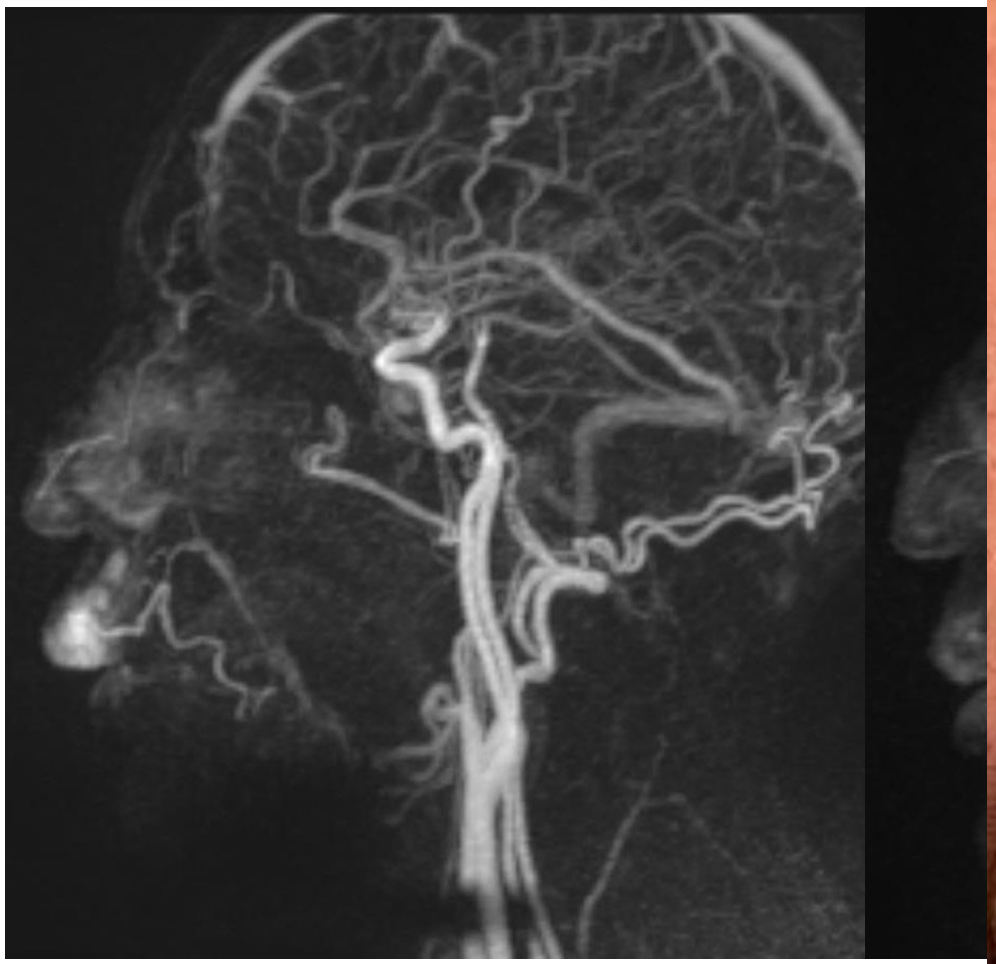
# Durchführung der RFA bei AVM

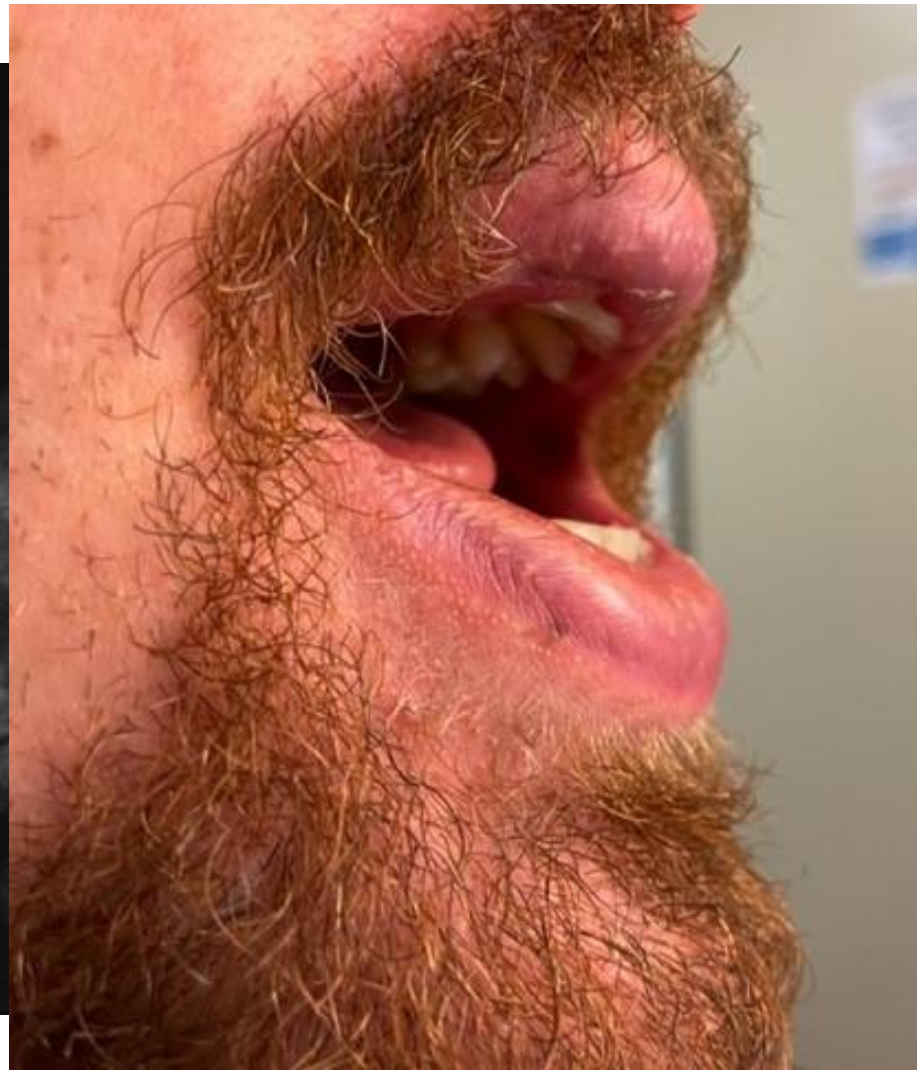


# Intermittierende Kontrollangiographie









# Zeit für Fragen

# Vielen Dank für Ihre Aufmerksamkeit

mtakes@mri-roentgen.ch