Le traitement par Ultrasons Focalisés (HIFU) va-t-il remplacer la chirurgie ?

GynAzur 25/06/2021

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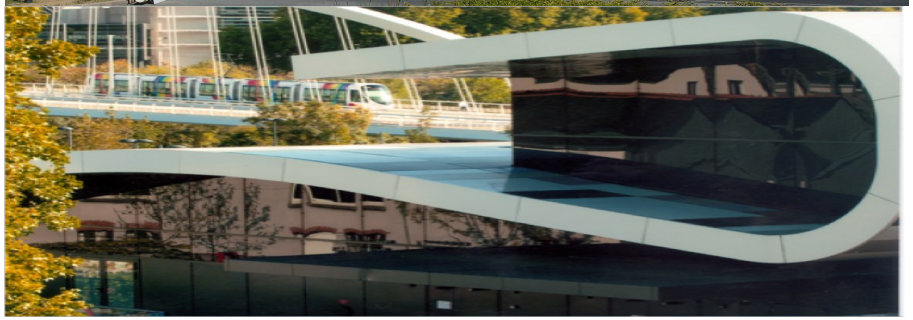


Liens d’interêt

Consultant pour :

Baxter, Ethicon, Gédéon-Richter, Merck

HIFU (High Intensity Focalized Ultrasounds)

HIFU (High Intensity Focalized Ultrasounds)

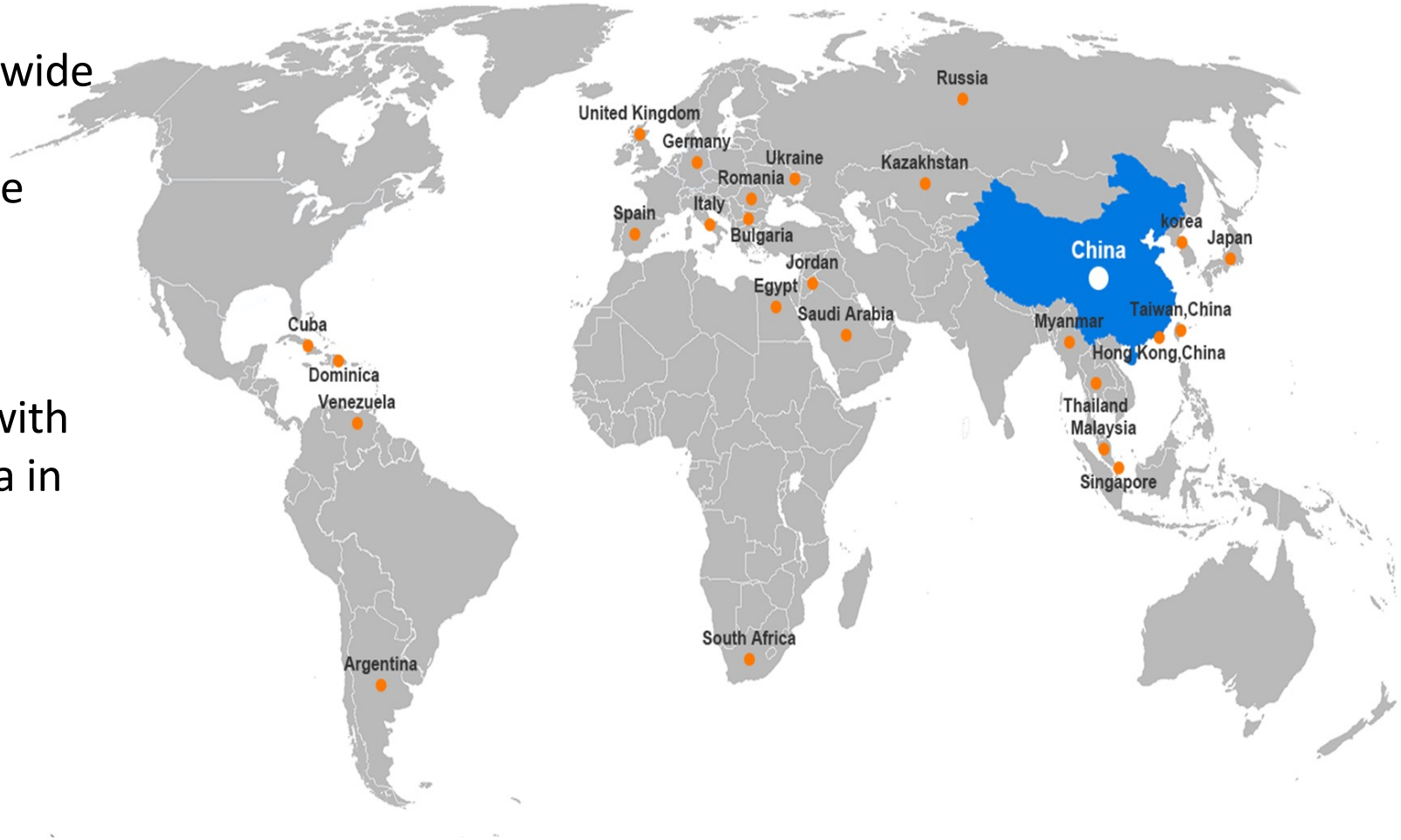
- Emerging, **non-invasive technique** for the conservative treatment of solid tumors
- Developed in China with US guidance in **1997** for treating primary liver tumors and first applied to uterine fibroids in **2002**
- Approved by FDA in 2004 for the treatment of uterine fibroids
- In 2009 FDA includes women with gestational desire as an indication for HIFU
- More than 50,000 women treated with HIFU worldwide

HIFU (High Intensity Focalized Ultrasounds)

227 HIFU Centers world wide

2010 : Authorized Europe (marquage CE)

17 000 women treated with HIFU for fibroids in China in 2017 !



What is HIFU?

- **H**igh-**I**ntensity transcutaneous **F**ocused **U**ltrasound

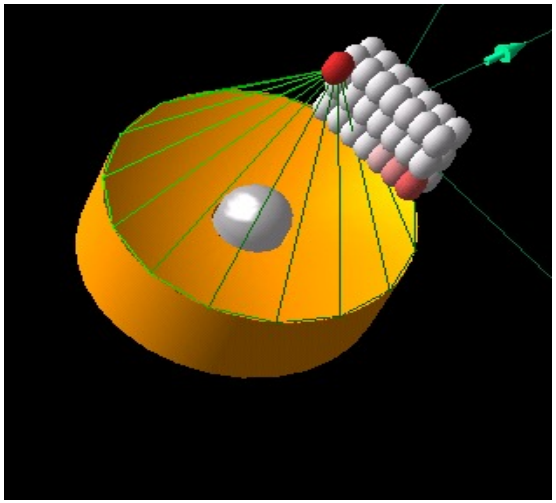
- Converging ultrasound waves focalized on a single, millimetric, focal point

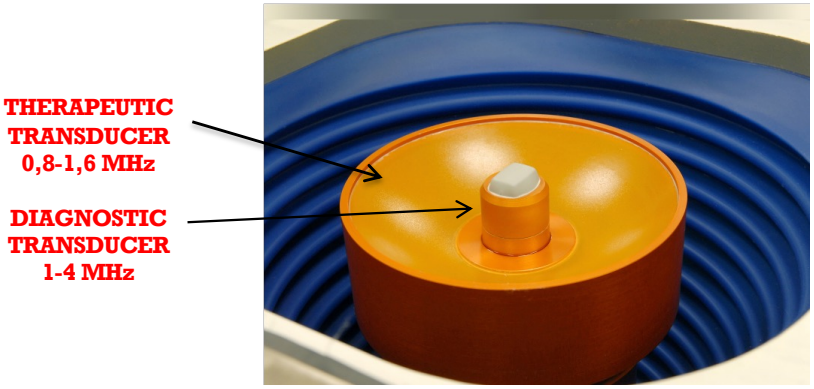
- Intense and immediate heat generated on the targeted tissue (between 56^{o} et 85^{o} C)

- Energy 10 000 times superior to conventional ultrasound-generated energy

What is HIFU?

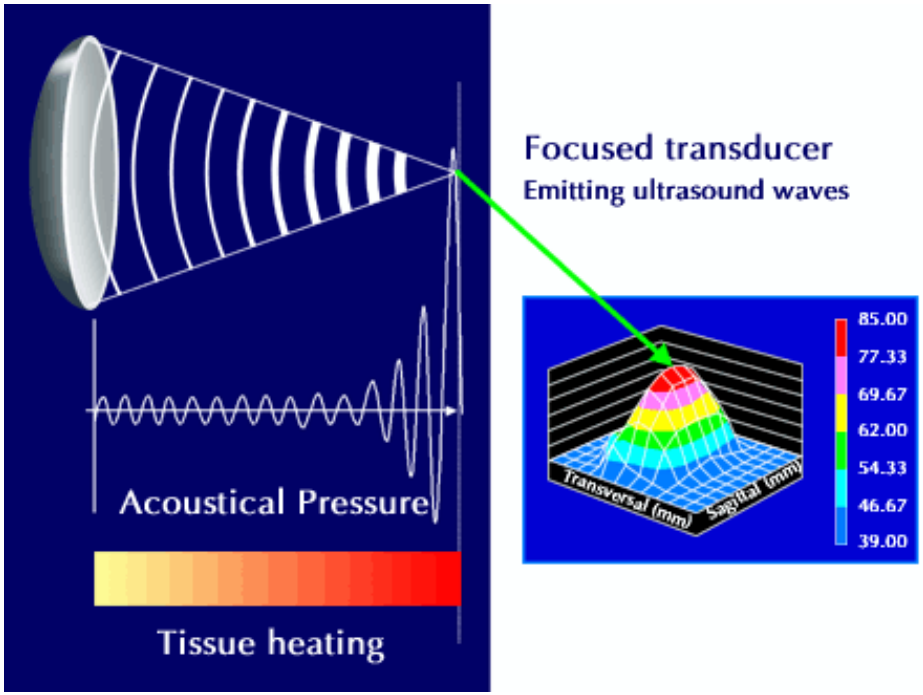
- HIGH INTENSITY ULTRASOUND WAVES ARE FOCUSED INTO THE FOCAL SPOT BY HIFU-TRANSDUCER
- **HIFU WAVES TRAVEL SAFELY THROUGH ADJACENT TISSUES**
- TISSUE AT THE SELECTED FOCAL SPOT SUDDENLY IS **HEATED (65-100^{o}C) AND DESTROYED**
- FOCAL SPOT IS GUIDED BY **REAL TIME US-IMAGING**





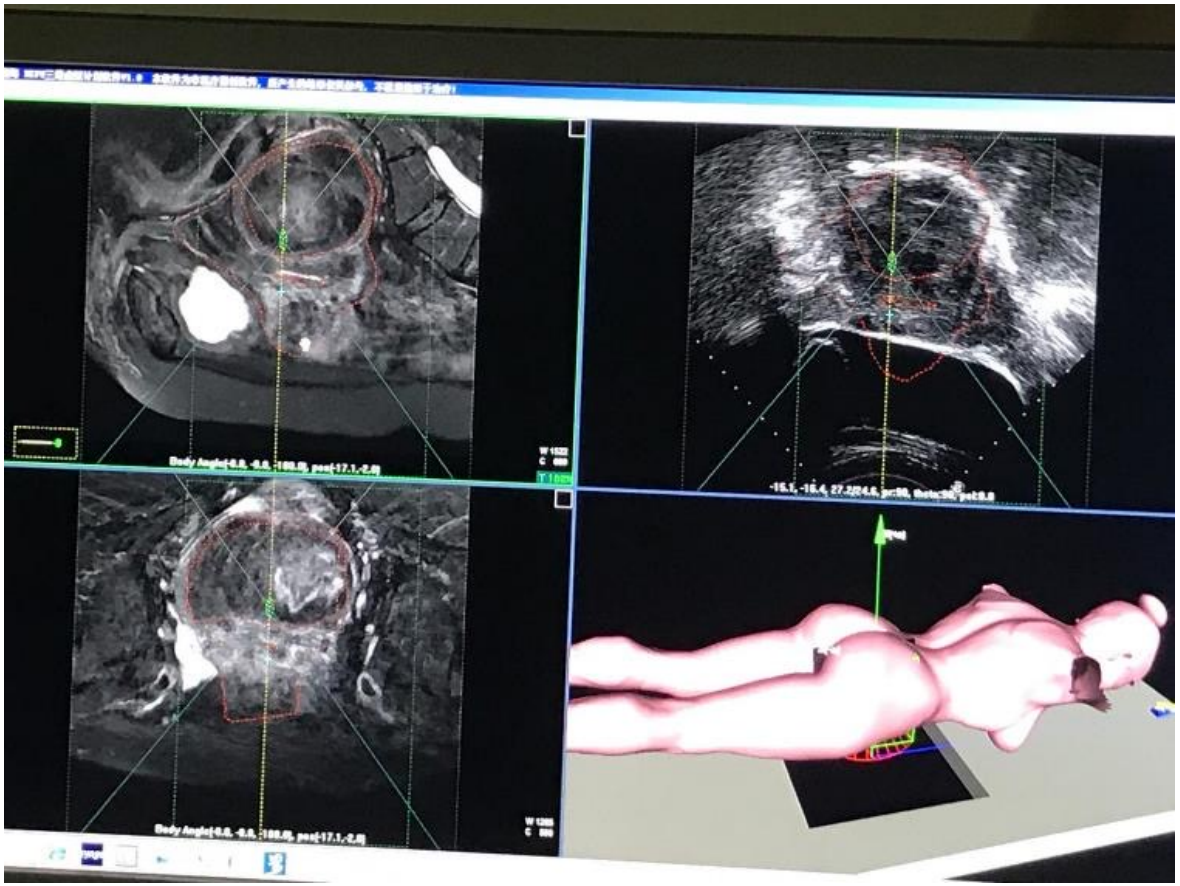
How does it work?

- **Hyperthermia** of selected tissue and thermal ablation of the targeted zone
- Ischemic **necrosis**
- **Intracellular cavitation** phenomenon



SAFETY

Procedure



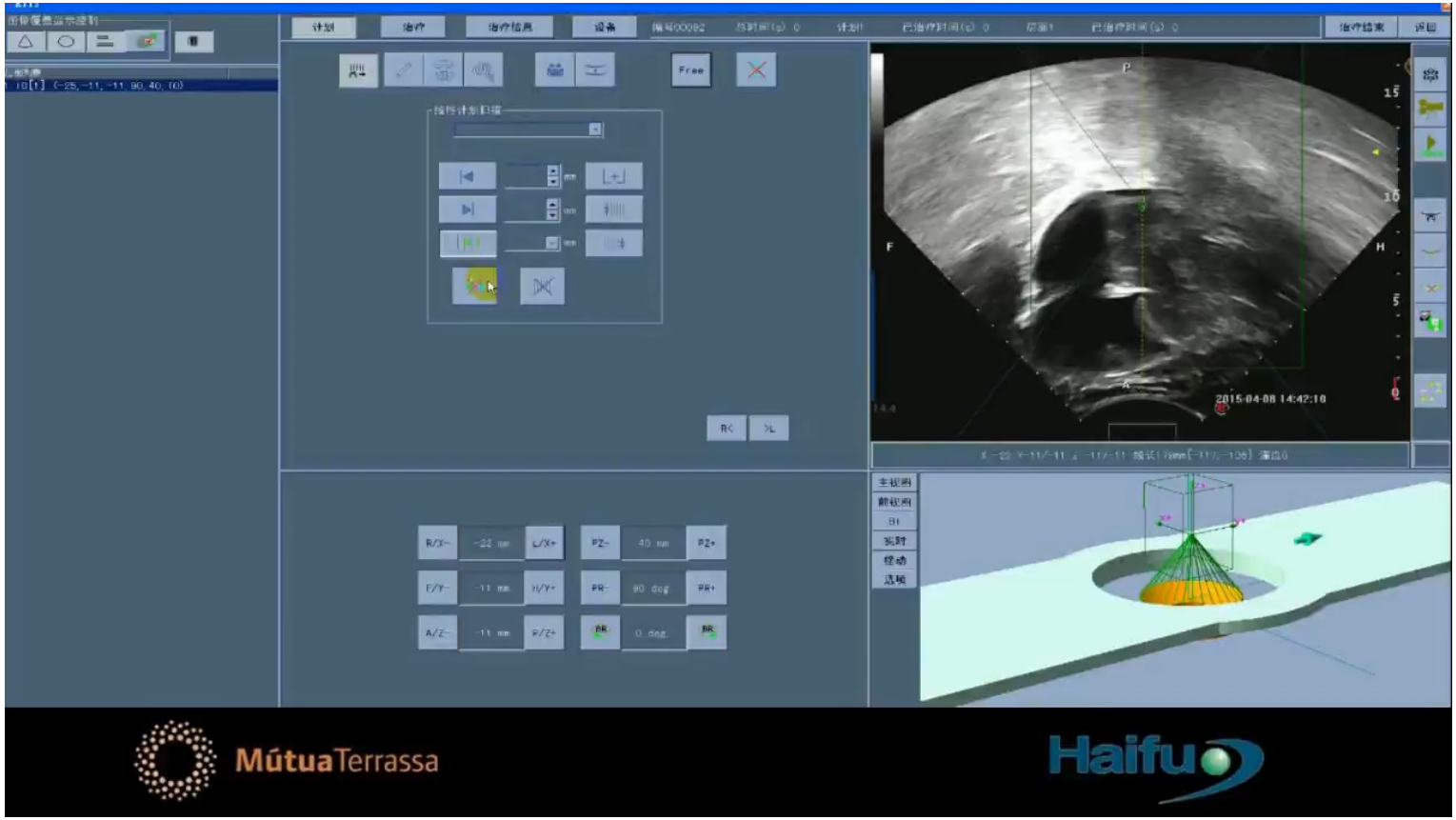
Procedure

- Patient is **lying face down**, with the abdominal wall immersed in degassed water.

- IV sedation (**remifentanil)** is used for pain control and to minimize body movement, without interfering with the patient’s ability perceive pain if abnormally high.

- **Urinary catheter** is in place, with the possibility of filling the bladder if needed.

Procedure *(JR)*



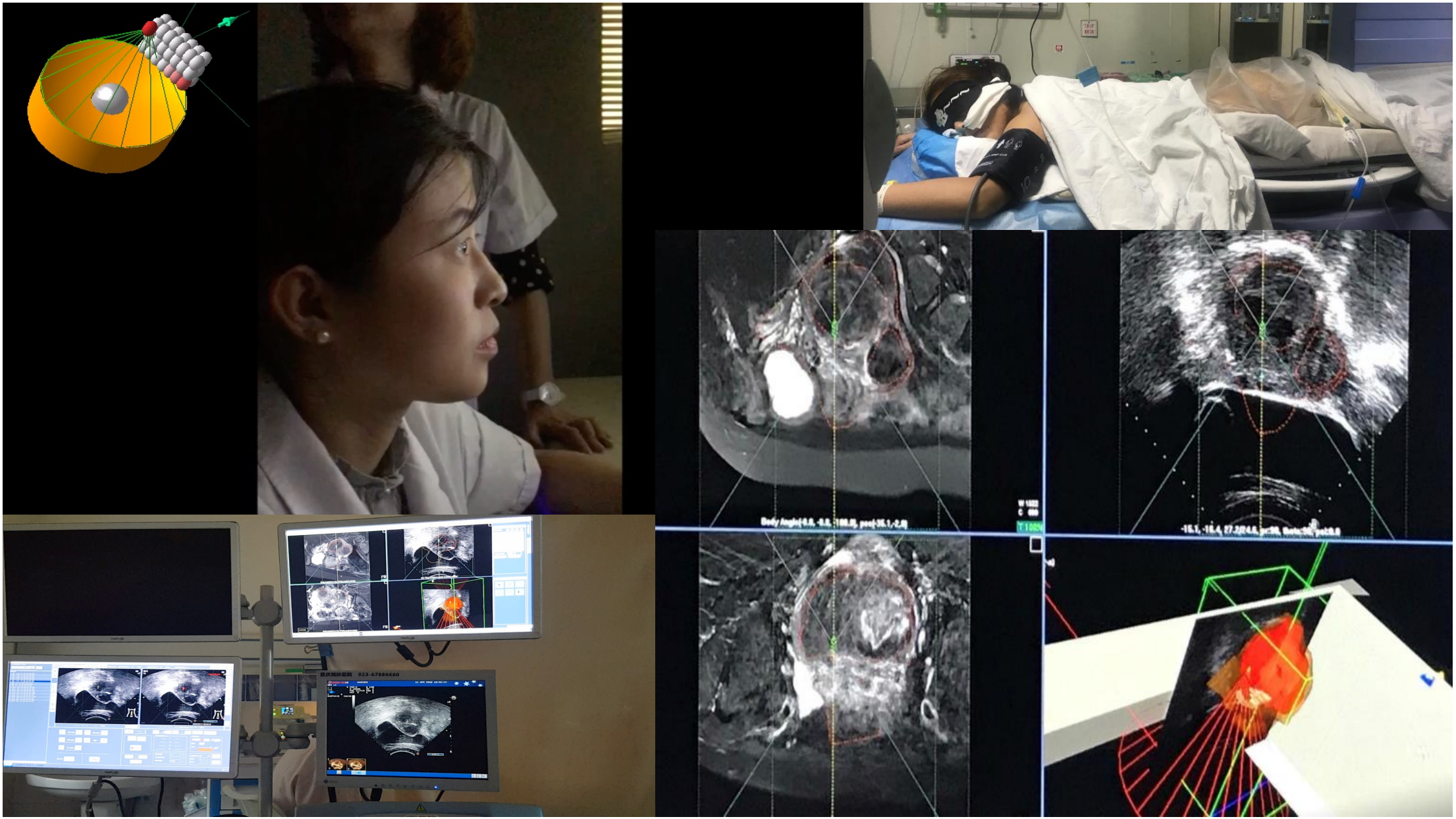
Procedure

- **Ocytocin** is perfused to diminish the vascularisation of the uterus and enhance the HIFU technique.

- Starting with the posterior aspect of the fibroid (<1cm from the serosa), ultrasound waves are methodically sent in sequence

- **Sonovue** IV contrast media is injected to visualize the fibroid's microvascularisation

- Total procedure duration: **1 - 2 hours**



MRI vs ultrasound HIFU – *The pros and cons*

MRgHIFU	USgHIFU
Image is more precise	Simple, rapid and less expensive than MRI
Higher security around the treated zone (thermal fusion better centralized)	Can be done by a gynecologist or a radiologist (learning curve)
Longer operating time	No dedicated intervention room needed
Needs to be done by a radiologist	MRI is still needed for precise localisation of the lesion

Overall, ultrasound-guided HIFU seems to be the most economical and practical alternative

Indications for HIFU in Gynecology

- **Symptomatic uterine fibroids**
- **Adenomyosis**
- **Parietal endometriosis**
- Placenta accreta
- Breast cancer
- Breast fibroadenoma
- Rectal endometriosis (evaluation in progress)
- Isthmic pregnancy

Indications for HIFU – Non gynecological

- Prostate cancer
- Liver cancer
- Pancreatic cancer
- Bone tumors

Advantages of the HIFU technique

- **Non invasive technique**
  - No risk of bleeding, no scar
  - Less risk of GI or GU trauma
- **Real-time control** of the procedure
- **Rapid**
- **Conscious sedation**
- **Short hospital stay** (could be done in an ambulatory setting)
- **Very low complications rate**

Descamps Ph. and al. *La Lettre du Gynécologue 2018*

Disadvantages of HIFU technique

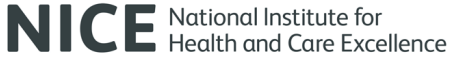
- **Cost** of the HIFU set-up
- **Operator formation**
- **Learning curve**
  - 40 procedures

Descamps and al. *La lettre du gynécologue 2018*


C N G O F


EMAS


SOGC


NICE
National Institute for
Health and Care Excellence

National Institute for Health and Care Excellence (NICE) – 2019 Recommendations

NICE National Institute for Health and Care Excellence

Ultrasound-guided high-intensity transcutaneous focused ultrasound for symptomatic uterine fibroids

Interventional procedures guidance [IPG657] Published date: July 2019 Register an interest

Results

- Fibroids volume **regress significatively**
  - 50% at 3 months
  - 66,7% at 6 months
  - 83,3% at 24 months

- Complications **are rare**
  - 3rd degree burn <1%
  - GI perforation <0,4%

- Pain generally subsides in <48 hours

NICE guidelines, 2019

NICE recommendations

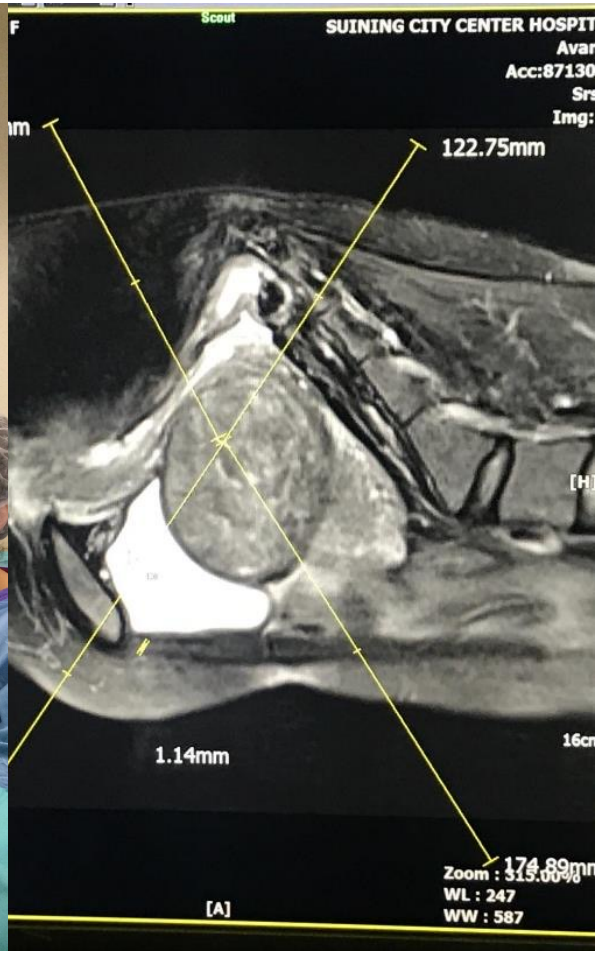
- NICE **encourages further research** and prospective data collection.

- NHS reimboursment december 2020 : **4150 £**

Will HIFU change our practise?

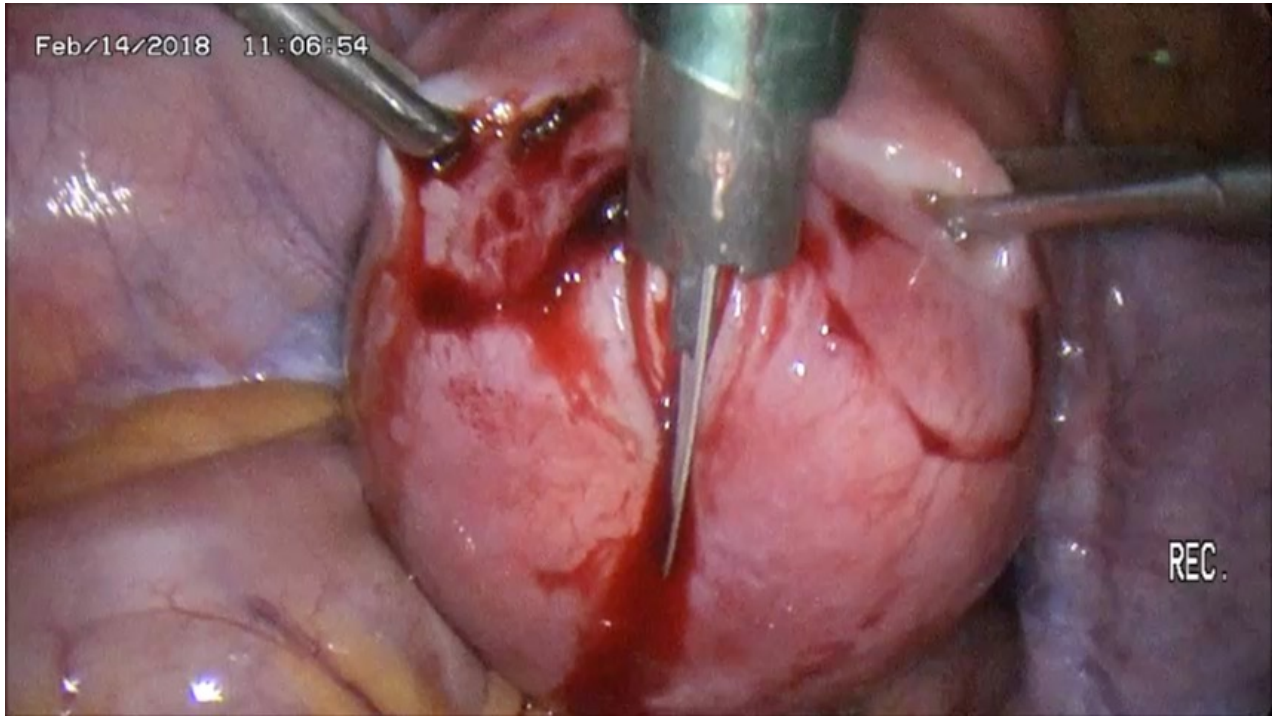
Advantages for the surgeon

- Non invasive
- Precise ablation of the lesion
- Organ preservation
- Restoration of organ function



Advantages for the patients

- No scar
- Organ preservation
- No need for blood transfusion
- No general anesthesia
- Short hospital stay
- Fast recovery
- Preservation of fertility



Financial incentives

- Same-day surgery
  - Increased hospital turnover
  - No need to use OR
- Decreased public healthcare expenses
- Reduced hospital waiting time

Conclusions

- HIFU is a **non-invasive technique** showing promising results for the treatment of fibroids

- Fast recovery
- Preservation of fertility

- Mandatory to make a good selection of cases taking into account several factors (age, type of myoma and gestational desire)

- Nice recommandations July 2019

Merci pour votre attention !