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RESEARCH ARTICLE

USE OF THE INVERSION BENCH IN THE PREPARATION OF THE PATIENT BEFORE THE MAGNETIC RESONANCE-GUIDED FOCUSED ULTRASOUND (MRGFUS) TREATMENT FOR UTERINE FIBROIDS

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ABSTRACT

Backround: There are several inclusion and exclusion criteria of patients affected by symptomatic and asymptomatic, single and multiple uterine fibroids, among them the interposition of bowel that do not allow the access to the ultrasound beam (Mascaretti *et al*., 2016). The use of the inversion bench before the treatment is a method that allows the inclusion of some patients.

Methods: from May 2016 to April 2017, 22 patients aged between 23 and 51 affected by single and multiple uterine fibroids (sized between 2 and 14 cm) have been placed on the inversion bench which allowed 15 of them to access the Magnetic Resonance-Guided Focused Ultrasound, since after a 15 minutes positioning on the inversion bench, an acoustic window was created, thus enabling the safe passage of the focused ultrasound beam.

Results: In our operating unit, 22 patients have been placed on the inversion bench. Of these, 15 after the Magnetic Resonance-Guided Focused Ultrasound (MRgFUS) treatment for single and multiple uterine fibroids. Patients have been closely evaluated by means of a complete gynecological examination, a transvaginal ultrasound, an MRI with and without contrast agent. After these specialized evaluations, it is possible to determine if the patient actually is an eligible candidate for the ultrasound treatment and if there is any bowel interposition that could interfere with the treatment. The symptom evaluation has been conducted by the means of the UFS-QOL questionnaire. All the evaluations have been carried out for the selection of patients that had to undergo the focused ultrasound treatment and after the treatment, a 3 months, 6 months and 9 months follow-up has been made. The use of the inversion bench allowed 15 patients to the treatment, who otherwise would have been excluded from the Magnetic Resonance-Guided Focused Ultrasound. They have been thus treated with success and avoiding any inconvenience.

Conclusions: The use of the inversion bench allowed the inclusion in the Magnetic Resonance-Guided Focused Ultrasound treatment of patients who otherwise would have been excluded. After the clinical evaluation, these patient were treated without any accident, exactly like the other patients (Mascaretti *et al*., 2016; Spies *et al*., 2002; Mascaretti *et al*., 2017).

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INTRODUCTION

Uterine fibroids represent one of the most common gynecologic diseases with a 25% incidence in women of all ages. This percentage tends to grow after 40s (Ryan *et al*., 2005; Sankaran, 2008; Parker, 2007; Stewart *et al*., 2017). Fibroids can be classified in submucosal, subserosal, intracavitary of different level G0, G1, G2 (according to the ESHERE scale), pedunculated. The MRgFUS treatment (Magnetic Resonance guided Focused Ultrasound) can be applied to every kind of fibroids excluding the pedunculated, since this one could detach and thus need another surgery.

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Symptoms are calculated through an UFS-QOL qestionnaire. Among exclusion criteria there is the bowel interposition in the anterior wall, which doesn't llow a safe and efficient access to the ultrasound beam. This inconveniente can be partly foreste tank to the Magnetic Resonance study with and without contrast agent, although some patients presented this contraindication only during the treatment itself, which hasn't started for this reason. The ue of the inversion bench has been introduce in our Operation Unit, and this allowed to contain the problem in some of the patients, and carry out the treatment successfully.

METHODS

From May 2016 to April 2017 a group of patients underwent an accurate evaluation carried out by a team of two

gynecologists, in order to be enabled to the Magnetic Resonance guided Focused Ultrasound treatment (MRgFUS) for uterine fibroids. These patients, aged between 23 and 51, presenting fibroids of different kinds, single, multiple, submucosal, subserosal and intramural, sized between 2 and 14 centimeters, underwent a pelvis Magnetic Resonance with and without contrast agent. This exam showed that 22 patients allowed a partial access caused by the interposition of bladder bowels that do not allow an appropriate access to the ultrasound beam. These patients have been included in the treatment. 15 out of 22 have been included in the ultrasound treatment. The accessibility to the ultrasound beam was created thanks to the use of the inversion bench right before the treatment. The patient get in position on the inversion bench and the Trendelenburg is applied. The position has to be kept for 15 minutes. After a second evaluation with Magnetic Resonance 3tesla, it appears that an adequate acoustic window has been created and thus the Magnetic Resonance-Guided Focused Ultrasound treatment has been successfully carried out, without any accident.

RESULTS

In the Operation Unit of the San Salvatore Hospital, in L'Aquila, the patients ready for the Magnetic Resonance-Guided Focused Ultrasound treatment for uterine fibroids have been evaluated by a team made y 2 gynecologists and 4 radiologists. Fibroids that can be treated are single and multiple, submucosal, subserosal and intramural. The evaluation entails a complete gynecologic exam, a transvaginal ultrasound and a Magnetic Resonance with and without contrast agent of the pelvis or low abdomen area. The symptoms severity is evaluated with an UFS-QOL questionnaire. After this evaluation it is possible to determine whether a patient fulfill the inclusion or exclusion criteria and if she can be treated by Magnetic Resonance-Guided Focused Ultrasound (MRgFUS). Exclusion criteria include the interposition of bowels in the anterior wall of the abdomen, which doesn't allow an adequate acoustic window for the safe passage of the ultrasound beam, since this could perforate the intestine with the heat. The evaluation of the bowel interposition is executed thanks to the Nuclear Magnetic Resonance with and without contrast agent with empty bladder on a 3tesla device. This evaluation is not considered to be unconditioned, since the day of the treatment, this inconvenience can show up despite the previous evaluation. The accessibility level is not absolute as well. 22 of the patients we have examined presented a partial accessibility. At the moment of the treatment, the Nuclear Magnetic Resonance showed that in these patients the interposition caused inaccessibility. The 22 patients have been placed on the inversion bench for 15 minutes with empty bladder in Trendelenburg position. They have been then re-examined by 3tesla Nuclear Magnetic Resonance and 15 out of 22 patients presented now an acoustic window that allowed the treatment execution. The Magnetic Resonance-Guided Focused Ultrasound treatment has been therefore successfully carried out without any accident. Patients are then examined again with Magnetic Resonance with and without contrast agent, with a complete gynecologic examination with transvaginal ultrasound and with the symptoms evaluation through an UFS-QOL questionnaire. Follow-up are made after 3, 6, 9 months (Bhandari *et al*., 2016; Alessandri *et al*., 2006; Taniguchi *et al*., 2016).

Conclusion

15 patients out of 22 have been included in the Magnetic Resonance-Guided Focused Ultrasound treatment, thanks to the positioning on the inversion bench for 15 minutes before the treatment. The Magnetic Resonance-Guided Focused Ultrasound has been executed on all the 15 patients with success and without any accident.

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