Intraoperative transvaginal ultrasound examination during myomectomy

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Received: 14 February 2018 / Accepted: 14 May 2018 / Published online: 17 July 2018
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Keywords Intraoperative ultrasound · Myomectomy · Myoma

Dear Editor,

Intraoperative ultrasound techniques have been used for a long time in some surgical areas, especially in liver surgery, where some authors describe the role of intraoperative ultrasound during radiofrequency ablation or hepatic resection in the assessment of the risk of post-treatment hepatocellular carcinoma recurrence [1]. However, in gynecology, these methods are not yet commonly employed. The present case shows one of the possible applications of intraoperative transvaginal ultrasound.

A 40-year-old woman was referred to our Hospital for heavy bleeding and uterine myomas. Ultrasound examination showed a fundic subserous myoma (45 mm in size), a posterior subserous myoma (33 mm in size), a left lateral intramural myoma (35 mm in size), and a right lateral intramural myoma (25 mm in size) with minimal distortion of the uterine cavity. On laparoscopy, the surgeon confirmed the presence of the two subserous myomas and the left lateral intramural myoma and removed them by minilaparotomy. After myomectomies, by laparoscopic view, the surgeon appreciated an irregular area on the posterior wall of the uterus, but he was uncertain of the diagnosis (Fig. 1a). Thus, an ultrasound examiner was involved to investigate intraoperatively this area confirming, with a transvaginal probe, the

presence of a right deep intramural myoma of 25 mm in size touching the endometrial cavity and with a free myometrial margin of 4 mm (Fig. 1b). During ultrasound examination, the gas was slightly reduced, but no saline was inflated in the pelvis. The intraoperative ultrasound findings showed no substantial differences compared to those described before surgery. The ultrasound examiner guided the surgeon to find the location of the myomas, to define the relationship of the myoma with the endometrial cavity and the site of the hysterotomy incision (*Supplementary video*). Histological diagnosis confirmed fibroids and the post-operative ultrasound examination described a regular uterine profile without any residual fibroids.

Uterine myomas are the most frequent gynecologic disease, with a recurrence rate after conservative surgery until 51–62% at 5 years [2]. This depends on the ability to perform a correct “radical” surgical approach which is strongly influenced by number, size, localization of myomas and distance between myomas, uterine serosa, and endometrium [3].

An appropriate preoperative evaluation is required to obtain an optimal surgical procedure, and transvaginal ultrasound is the most used diagnostic method, due to its feasibility and availability. However, some fibroids are difficult to detect during surgery, especially when the palpation is not possible or limited, as during laparoscopy or minilaparotomy.

Recently, intraoperative ultrasound examination has been proposed in this setting as a useful method to guide the surgeon during myomectomy. Paul et al. demonstrated that intraoperative transvaginal ultrasound is helpful to the surgeon for identifying deeper myomas making the surgery more effective [4]. Other authors reported cases of an intraoperative ultrasound using a laparoscopic probe to guide surgeon to identify the correct placement of the uterine incision during laparoscopic myomectomy [5, 6]. Others

Electronic supplementary material The online version of this article (<https://doi.org/10.1007/s40477-018-0310-9>) contains supplementary material, which is available to authorized users.

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Fig. 1 Laparoscopic image **a** showing an irregular area on the posterior wall of the uterus (indicated by laparoscopic instrument) and intraoperative gray-scale ultrasound image **b** showing a fibroid in correspondence of the same irregular region, indicated by surgeon

described an intraoperative ultrasound approach applying directly the probe against to the uterine serosa during open myomectomy, demonstrating that intraoperative ultrasound was more efficient than palpation in identifying residual fibroids at the end of open myomectomy [7]. We reported a case of intraoperative ultrasound using a transvaginal probe during minilaparotomy with laparoscopic view, supporting that transvaginal ultrasound examination, similarly to the other approaches (endoscopic ultrasound or ultrasound with contact probe), plays a role to guide the surgeon during the procedure.

In conclusion, this is an example of an application of intraoperative transvaginal ultrasound examination to accurately locate deep intramural myomas making minimally invasive techniques feasible and accurate in eradicating all the myometrial lesions.

Ultrasound examiner and surgeon should work more often together to guarantee the best therapeutic management for the patient in gynecological setting.

Compliance with ethical standards

Conflict of interest The authors declare that there is no conflict of interest regarding the publication of this paper.

Ethical approval An approval by ethics committee was not applicable.

Informed consent Informed consent was obtained from the patient.

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