Hysteroscopic septum resection and reproductive medicine: A SWOT analysis

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ABSTRACT

Hysteroscopic septum resection in patients with unfavourable reproductive and clinical outcomes has become a common practice worldwide to improve reproductive results. However, there is still no clear evidence on the possible advantages and drawbacks with regard to this procedure. In this opinion paper, based on a SWOT (strengths, weaknesses, opportunities, threats) analysis, the different aspects of this strategy are evaluated.

Keywords: Septate uterus, septum resection, metroplasty, infertility, recurrent miscarriage, spontaneous abortion, preterm delivery

INTRODUCTION

Septate uterus is the most common congenital uterine anomaly, accounting for 35% of all identified uterine anomalies (Chan et al. 2011). According to the new ESHRE (European Society of Human Reproduction and Embryology)/ESGE (European Society for Gynaecological Endoscopy) classification system of female genital anomalies, a septate uterus is defined as a uterus with a normal outline and an internal indentation (septum), at the fundal midline, exceeding 50% of the uterine wall thickness (Grimbizis et al., 2013).

Septate uterus has been associated with reduced fertility, increased miscarriage rates, increased preterm births, malpresentation at delivery (RR 4.35, 95% CI 2.52 to 7.50) and intrauterine growth restriction (Chan et al., 2011; Venetis et al., 2014).

The pathophysiology of this poor reproductive outcome is unknown. Earlier studies asserted that the septum was avascular and mainly consisted of fibrous tissue (Fayez, 1986, March et al., 1983) and that the main cause of impaired fertility in women affected was a disturbed implantation due to decreased receptivity of the endometrium that blocked the septa from preovulatory changes (Fedele et al., 1996). More recent studies suggest that the septum consists of normal endometrium and myometrium, and resembles the uterine wall (Naftalin et al, 2009; Ludwin et al., 2014). It is unclear whether or not restoring normal anatomy also restores normal function, thereby improving fertility outcomes in women who wish to conceive.

Initially, the uterine septum was resected by a laparotomic hysterotomy (Paradisi et al., 2014a), but since the introduction of hysteroscopic septum resection in 1970, this approach is considered first-line therapy (Edström et al., 1970). Despite some possible complications of a hysteroscopic septum resection, such as perforation of the uterus, bleeding, postoperative intrauterine adhesions, and uterine rupture in subsequent pregnancies (Valle et al., 2013), it is a common practice worldwide to improve reproductive outcomes (Paridisi et al., 2014). Nevertheless, this procedure is assumed to be effective based only on non-randomized and mainly retrospective cohort trials (Rikken et al., 2017; Kowalik et al., 2011; Bosteels et al., 2015). Most of these studies have a high risk of bias mainly due to their before/after design, with the same group of women serving as trial and control, given that before-after comparison studies will always favour the intervention (Mastenbroek et al., 2006) and the prognosis without the intervention is usually good (Christiansen et al., 2005).

Moreover, a publication bias seems to exist, as papers with positive pregnancy outcomes are more frequently published. As a consequence, we are currently unaware of whether or not a

septum resection may increase the chances of a live birth and whether this outweighs the possible complications of the procedure. Secondly, a scarcity of data exists in terms of financial burden comparing the costs of metroplasty versus expectant management and there is a need to assess the different aspects related to the application of this procedure (see Figure 1) to shed light on the current role of septate uterus resection in the reproductive performance.

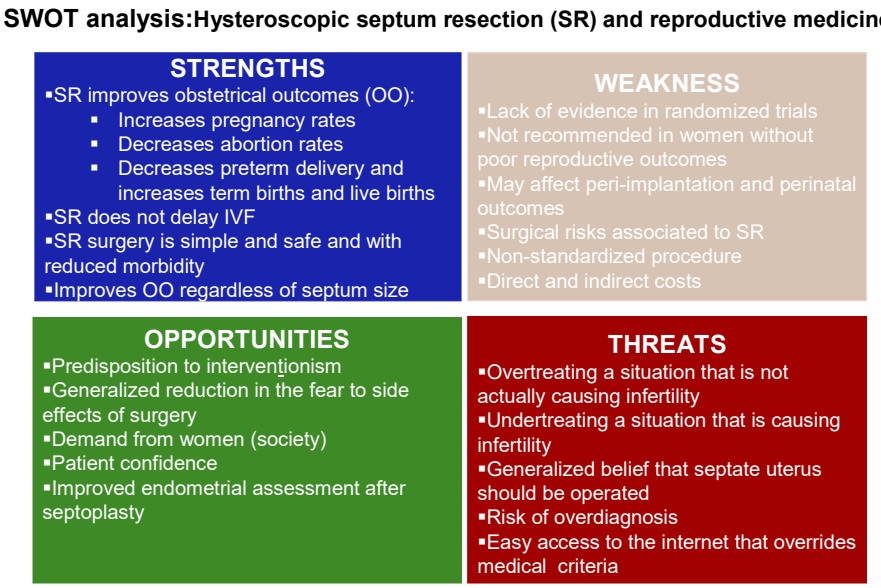

Figure 1: SWOT analysis of hysteroscopic septum resection

In this regard, as no solid medical evidence exists, we designed the following SWOT analysis to assess the available published evidence about the possible recommendation of septum resection for women of reproductive age with a septate uterus.

I. STRENGTHS

Septum resection improves obstetrical outcomes

The majority of studies suggest that a uterine septum resection leads to an improvement of spontaneous pregnancy rates in infertile women (Venturoli et al., 2002; Saygili-Yilmaz et al., 2003; Colcacurci et al., 2007; Mollo et al., 2009; Selvaraj et al., 2010; Bakas et al., 2011; Shokeir et al., 2011; Bendifallah et al., 2013; Valle et al., 2013; Esmacilzadeh et al., 2014) and in women with recurrent spontaneous abortions (Kormányos et al., 2006; Pang et al., 2011). When the potential benefit of a hysteroscopic treatment of uterine septa on pregnancy rates is evaluated by analysing only parallel comparative studies, a beneficial effect has been observed (but did not reach statistical significance), particularly in the group of infertile patients (Venetis et al., 2014). With respect to patients with septate uterus with no history of adverse reproductive outcomes, some researchers support the use of hysteroscopic resection (Grimbizis et al., 1998; Jurkovic et al., 2007), whereas others do not (Corson et al., 1992)

One of the largest studies to evaluate obstetrical outcomes was a retrospective case series of 361 patients with septate uterus who had primary infertility for >2 years and a history of 1-2 spontaneous miscarriages, or recurrent pregnancy loss (Saygili-Yilmaz et al., 2003). In women with a history of miscarriages, the miscarriage rate decreased from 91.8% to 10.4% following septum resection. In this group the live-birth rate prior to surgery was 4.3%, while after septum resection the live-birth rate increased to 81.3%. In the recurrent pregnancy loss group, the miscarriage rate decreased from 94.3% to 16.1% following septum resection and the live-birth rate also improved from 2.4% to 75%.

Two systematic reviews (with a pooled analysis) and a meta-analysis (Hommer et al., 2000; Nouri et al., 2010; Valle et al., 2013) assessed the impact of septum resection on pregnancy and live-birth rates. Hommer et al. carried out a review of 12 published retrospective studies, and compared reproductive outcomes before and after hysteroscopy surgery. Such comparisons showed a pooled postoperative pregnancy rate of 80% in women with miscarriage or infertility and the term live birth rate increased from 0% to 7% to 73% to 100% after surgery, respectively. Another study, a systematic review and pooled analysis of 1501 women in 18 studies (Nouri et al., 2010) reported an overall pregnancy rate of 60.1% and a live-birth rate of 45% after hysteroscopic metroplasty. These rates were very similar to those obtained in a subsequent meta-analysis that was comprised of 29 studies evaluating the effect of septum resection in a mixed population of patients with infertility, miscarriage, and/or recurrent pregnancy loss that found that the overall pregnancy rate after septum resection was 67.8% (95% CI, 62.5–72.8) and the live-birth rate was 53.5% (95% CI, 47.8–59.1). (Valle et al., 2013). Perhaps the most important inference from this last meta-analysis is the clinical heterogeneity within and between studies. Authors stated that these rates may certainly be higher in subjects with exclusively recurrent miscarriages in whom their septum has been removed, and lower in those with other causes of infertility.

With regard to the impact of septum resection on unexplained infertility, two prospective observational studies have been carried out. In one of these studies, 44 women with a septate uterus and no other causes of infertility were compared with 132 women with unexplained infertility (Mollo et al., 2009). The septum group was initially treated with hysteroscopic septum resection. At 12 months, the group that underwent septum resection had a higher pregnancy rate of 38.6% compared with 20.4% in the unexplained infertility group ($P < .05$).

In another prospective observational study, 88 patients with a septate uterus and >2 years of unexplained infertility (all causes excluded) underwent septum resection. Following surgery, 41% of the patients conceived with a median time to conception of 2.6 - 7.5 months (Shokeir et al., 2011).

Septate uterus is associated with a high prevalence of both repeated assisted reproductive technology (ART) failure (18.2%) (Raga et al., 1997) and early pregnancy loss after ART (9.7%) (Dicker et al., 1996). Several studies also suggest an improvement in IVF gestation rate after resection of the septum (Ozgur et al., 2007; Tomazevik et al., 2010; Abuzeid et al. 2014). With regard to the impact of septum resection on live-birth rates in women with primary infertility who underwent IVF, researchers suggest that this procedure is beneficial prior to IVF-ET based on the results of full term, preterm, and severe preterm birth rates as well as on mean gestational age in pregnancy (Abuzeid et al., 2014).

Septum resection decreases abortion rate

Numerous studies have found that septum resection reduces the rate of abortion (Hickok et al., 2000; Kormanyos et al., 2006; Colcacurci et al., 2007; Venturoli et al., 2002; Wang et al., 2009; Bendifallah et al., 2013; Tehraninejad et al., 2013; Gundabattula et al., 2014; Freud et al., 2015). A meta-analysis (Venetis et al., 2014) that included six studies (167 women treated, 124 women non-treated) offered data on the association of hysteroscopic septotomy and the probability of spontaneous abortion in general and showed that women who underwent septum resection had a significantly decreased probability of spontaneous abortion compared with women who did not undergo treatment (RR 0.37, 95% CI, 0.25-0.55). This decrease in the abortion rate has also been observed in IVF clinical practice (Ozgur et al., 2007; Ban-

Fraugez et al., 2008). Several theories have been offered to explain why repetitive abortions occur in women with uterine septum with the most generally accepted cause being that of decreased vascularization of the septal area, as demonstrated during surgical division of the septum when the uterus is distended, therefore affecting blastocyst implantation and nutrition of the implanted embryo (Fedele et al., 1989).

Septum resection decreases preterm delivery and increases term births and live births

Hysteroscopic septum resection is associated with a reduction in preterm labour rates (Kormanyos et al., 2006; Bendifallah et al., 2013; Crane et al., 2014; Gundabattula et al., 2014; Freud et al., 2015) and a meta-analysis carried out by Venetis et al. suggested a decreased, yet not significant, probability of preterm labour (<37 weeks) in women who had been treated with hysteroscopic resection of the septum compared with women who had not been treated (RR 0.66, 95% CI, 0.29–1.49) (Venetis et al., 2014). Some data regarding an improvement in live-birth rate and full-term labour in women with infertility or prior pregnancy loss (Hickok, 2000; Saygili-Yilmaz et al., 2003; Tehraninejad et al., 2013; Gundabattula et al., 2014) and women after IVF (Abuzeid et al., 2014) have also been published.

Septum resection does not delay time to perform IVF

Nowadys Many IVF centres recommend removal of the septum before an assisted reproductive treatment (ART) to reduce the possibility of miscarriage (Raga et al., 1997.) and

to improve pregnancy outcome (Ozgur et al., 2007). Although hysteroscopic excision of uterus septum leaves an injured area within the endometrial cavity, it is rapidly covered by nearby healthy endometrium and initiating an ICSI/embryo transfer cycle immediately following the hysteroscopic procedure does not result in any impairment in implantation rate or pregnancy rate compared to those initiated 10 or more weeks after the procedure. (Berkkanoglou et al., 2008)

Septum resection surgery is simple, safe, and with reduced morbidity

Hysteroscopic septum resection is a simple, safe and effective procedure for achieving normal uterine shape (Parsanezhad et al., 2006; Jansen et al., 2008). According to most studies, few complications have been observed in hysteroscopic septum resection (Homer et al., 2000; Zikopoulos et al., 2003; Selvaraj et al., 2010; Grynberg et al. 2012; Wang et al, 2013; Esmaeilzadeh et al 2014; Roy et al., 2015) as post uterine septum resection rupture, fluid and electrolyte imbalance, and thermal injury or perforation have been reported very infrequently (Conturso et al., 2003). Nevertheless, the fact that the retrospective design of these studies could introduce reporting bias must be kept in mind when analysing these data. In addition, the side effects of surgery, which include the risk of both pelvic adhesions and caesarean delivery, are reduced with hysteroscopy. Therefore it has been recognized as a favourable and safer therapeutic procedure for uterine septum removal (Hickok et al., 2000; Bettocchi et al., 2007; Ignatov et al. 2008).

Because of the minimally invasive nature of hysteroscopic metroplasty and the associated low morbidity rate, some authors have argued for prophylactic hysteroscopic metroplasty in women with unexplained infertility, before assisted reproductive treatment, or even for

section of the septum at the time of diagnosis to prevent miscarriages and labour complications (Mencaglia et al., 1996; Homer et al., 2000).

Improves obstetric outcomes regardless of septum size

There is insufficient evidence to conclude that obstetric outcomes are different when comparing the size as defined by length or width of uterine septa. Similarly to a large uterine septum, a small uterine septum has been reported as an important hysteroscopically preventable risk variable for preterm birth (Pabuccu et al., 2004; Kormányos et al., 2006; Tomazevik et al., 2007). A study carried out by Paradisi et al. in 132 women demonstrates that hysteroscopic metroplasty in cases of partial uterine septum and infertility significantly improves the reproductive performance irrespectively of septum size and that reproductive performance is independent from previous obstetrics history (Paridisi et al., 2014b).

II. WEAKNESSES

Lack of evidence in randomized trials showing septum resection improves obstetrical outcomes

Despite the potencial advantages of hysteroscopic septum resection, a recently published Cochrane review (Rikken et al., 2017) concluded that there are no solid evidences to support this procedure for women as a means to improve reproductive outcomes, because no randomised controlled trial (RCT) comparing hysteroscopic septum resection with expectant management has been published. In this regard, high quality RCT are urgently needed, and two trials are currently underway.

Not recommended in women without poor reproductive outcomes

There is also an ongoing debate on whether operative hysteroscopy should be performed to repair septate uterus in women who have not experienced adverse reproductive outcomes. Although some studies suggest that hysteroscopic resection should be performed once a woman is diagnosed with septate uterus in order to reduce the possibility of spontaneous abortion (Lin et al., 2009; Tonguc et al., 2011), a prospective study suggested that there was no significant difference in pregnancy outcomes between women with no history of poor reproductive outcomes who underwent surgery and those who underwent a conservative approach (Pang et al., 2011). Hence, patients with septate uterus who have no poor reproductive outcome may not need to undergo operation before pregnancy.

May affect peri-implantation and perinatal outcomes

Moreover, although surgical technologies have improved greatly, the procedures may still induce unintentional inflammatory reactions, that may affect placentation and, thus, the peri-implantation and perinatal outcomes of subsequent conceptions (McCarthy et al., 2013; Pundir et al., 2014). Data from a retrospective observational analysis using ultrasound confirmed pregnancies from ICSI treatments (Ozgur et al., 2015) show that some patients who had hysteroscopic surgery for partial intrauterine septa may still be susceptible to a greater risk of foetal loss, possibly due to intrauterine factors that are non-correctable (Taylor et al. 2008; Sparac et al., 2001). These aetiologies remain largely unknown; however, studies have

suggested that factors such as altered intrauterine pressure dynamics and/or cervical incompetence are the most probable mechanisms underlying these losses (Homer et al., 2000) In fact, a retrospective cohort study by Crane et al. (2015) evaluated cervical length post resection as a marker of prematurity (<35 weeks gestation) and the results show that pregnant women with a history of a hysteroscopic uterine septum resection have shorter cervical lengths than controls (2.9 vs. 4.3 cm, $p < 0.0001$) and higher rates of spontaneous preterm birth <35 weeks gestation (4% vs 0.7%), but they did not reach statistical significance, probably due to a small sample size (n=24) (Crane et al., 2015). Moreover, the impact of the Asherman syndrome associated to septum resection in pregnancy is well documented with a high rate of infertility, miscarriage, poor implantation following *in vitro* fertilization and abnormal placentation.

Surgical risks associated to septum resection

In addition, as with any surgical procedure, hysteroscopic septum resection may have its complications, some associated with the surgical technique used (uterine perforation, haemorrhage, infections, etc) and others with a possible damage to the endometrium (inflammations, Asherman, abnormal placentation, cervical insufficiency, etc). Although the risks of surgery are minimal, some are life threatening such as uterine perforation or uterine rupture in subsequent pregnancies, excessive haemorrhage and infection (Kenda et al., 2016). Other risks of surgery described in the literature are abnormal anatomic results (Prospt et al., 2000).

Uterine perforation after hysteroscopic septum resection is a rare complication, and its frequency is reported to be approximately 1-3%. (Shveiky et al. 2007, Ergenoglu et al., 2013). A deep incision during hysteroscopy is the most common predisposing factor for early rupture

and the simultaneous application of laparoscopy or ultrasonography may prevent this acute complication. (Sentilhes et al., 2004). Uterine rupture during subsequent pregnancies is correlated with excessive septal excision and penetration of the myometrium, which can be detrimental for both the mother and foetus (Jansen et al., 2000; Kenda et al., 2016). A literature review reveals that uterine rupture during pregnancy or delivery following hysteroscopic septum resection has been documented in 18 case reports (Valle et al. 2013). Myometrial damage is believed to be the predisposing factor for uterine rupture and another major factor is the frequency and intensity of uterine contractions during pregnancy.

There is no standardization for the interval between operative hysteroscopy and subsequent pregnancies in women with uterine rupture complications and may vary between 1 month and 5 years according to the literature (Sentilhes et al., 2005). Cases of metrorrhagia have also been reported. Scoccia et al. reported two cases of post-hysteroscopic metroplasty bleeding treated successfully with intravenous estrogen therapy (Scoccia et al., 2009).

Regarding abnormal anatomic results they can include a residual septum at the uterine fundus and isolated intrauterine adhesions in other locations (Ludwin et al., 2014). Due to the surgeons' subjective assessments of the completeness of resection and a lack of standardised post-operative evaluation of the uterine cavity, there is a high risk of bias. Additional studies are needed to evaluate the effects of septal morphology, the suitability of the ESGE-ESGE criteria in evaluating uterine septa, the use of barrier agents to prevent adhesion formation, and the effects of various anatomic results on reproductive outcomes such as pregnancy, miscarriage, and live birth rates.

Non-standardized procedure

Hysteroscopic management of uterine septum can be performed in the operating room under anaesthesia, or in an office setting. Commonly used techniques include incision of the septum utilising cold scissors, unipolar or bipolar cautery, or laser for septum resection. Use of distending media for the uterus is dependent on the incision technique or energy source and includes saline, glycine, sorbitol, or mannitol (ACOG 2005). An important limitation of this procedure is that there is no standardized technique for performing hysteroscopic septum resection and insufficient evidence to recommend a specific method. There are one RCT (Colacurci et al. 2008) and some restrospective studies (Cararach et al., 1994; Litta et al., 2008;) evaluating the efficacy or complications by comparing the different hysteroscopic techniques with each other. Hysteroscopic septum resection with Versapoint carried out in an office setting is nowadays considered the procedure of choice given that the posible complications which may arise from the aenesthesia are avoided and costs are reduced, furthermore the use of the resectoscope and glycine are associated with a greater number of complications.

Direct and indirect costs

A significant limitation to whether or not extend the use of this technique is that no cost-effectiveness studies have been published so far. Nevertheless, septoplasty is considered an expensive procedure and its cost varies widely and depends on several variables. In particular, the cost of hysteroscopy without resection of the septum has been estimated at about 126 euros for day case hysteroscopy and 59 euros for outpatient hysteroscopy (Kasius et al., 2013). The lower staff costs, sterilising costs and avoidance of general anaesthesia all contribute to making outpatient hysteroscopy more affordable than day case hysteroscopy on a ‘per patient’ basis (Marsh et al., 2004).

In a study in 2002, the costs for hysteroscopic surgery procedures (Versapoint) were approximately 1215 euros (Clark et al., 2002) but no more recent economic studies have been published. Mean hospital charges for the procedure are estimated at 1686 (1223-2447) euros (includes room, nursing, surgical, anaesthesia and physician charges). Outpatient procedure offers many benefits over its traditional counterpart, including a faster speed of recovery, less time away from work and home and cost savings for the woman, her employer and the National Health Service.

No significant difference was found between the mean cost of surgery with no guidance and that of surgery under ultrasound guidance and the average charge for ultrasound assistance was lower than the average charge for laparoscopy ($327 vs $2899 after adjustment for inflation) (Kresowik et al. 2012). According to the published literature, the application of a routine hysteroscopy prior to IVF may be cost-effective in women with intrauterine anomalies, and is most influenced by the variance in the increase in ongoing pregnancy rates by performing a hysteroscopy (Kasius et al. 2013). It is also important to estimate travel expenses and other indirect costs such as the cost of missed working days. Therefore, additional data on this subject is crucial to recommend the most cost-effective strategy for daily practice. (Kasius et al. 2013).

II. OPPORTUNITIES

Predisposition to interventionism

Nowadays, social and cultural values favour a greater predisposition to medical interventionism (Rath et al., 2008; Humphrey et al., 2009; McAra-Couper et al., 2010) and the confidence in the intervention by the patients shows greater satisfaction and quality of life (Berger et al., 2006; Kuppermann et al., 2013).

In the case of hysteroscopic techniques (removal of a uterine septum, endomyometrial resection, myomectomy, polypectomy, and adhesiolysis), a high level of patient satisfaction and a trend towards outpatient intervention has been observed. Specifically, the Wortman et al. study showed that 98.8% of respondents were either "very satisfied" or "satisfied.", 97.6% preferred the office to a hospital setting and 98.0% stated they would recommend the procedure to a friend. (Wortman et al. 2013).

Generalized reduction in the fear to side effects of surgery

The good anatomical and functional results, as well as the generalized reduction in the fear of side effects of surgery, have favoured the diffusion of varied surgical procedures. In fact, surgeries such as breast implants, buttock prosthesis, reduction of the labia minora, liposuction, etc. are currently being carried out frequently in women. This is due to the fact that each time surgical procedures are simpler and less risky and guarantee faster recovery rates for the patients (Ferry et al., 1994; Kremer et al., 2000; Guida et al., 2004; Marsh et al., 2008). In the specific case of hysteroscopic resection of the septum, the introduction of small-diameter operative hysteroscopes has enabled physicians to perform operative hysteroscopy in an office-based surgical setting with the possibility to diagnose and treat lesions in a single session without parenterally administered analgesia or sedation (Lindheim et al., 2000; Wortman et al., 2013).

Demand from women and society to solve their problems, such as those related to infertility.

There is an increasing number of studies that indicate the great involvement of patients taking an active part in the decision-making and in the resolution of their medical problems, including those related to infertility. In the services of Gynaecology and Obstetrics, some opinion papers confirm the possibility of complying with patients' demands, such as performing a caesarean instead of a vaginal delivery, without prior medical indication (Rath et al., 2008). A Cochrane review of 2015 (Aarts et al., 2015) analyses the effectiveness and safety of different surgical options for hysterectomy in women with benign gynaecological processes and concludes that the surgical approach should preferably be decided by the patient after discussing the options with her surgeon. In this situation, a woman's right to self-determination (Rath et al., 2008), may favourably increase the hysteroscopic resection of the uterine septum as an option to increase the probability of ongoing pregnancy.

Patient confidence

Septate uterus has been associated with a higher rate of early and recurrent abortions, reproductive failure and obstetric complications, although it has not been clearly related to infertility. The hysteroscopic resection may improve all these problems, while also being a simple and low complication rate intervention (Zabak et al., 2001) that would bring greater confidence and tranquillity to the patients to proceed with the search to achieve pregnancy, spontaneously or by assisted conception.

Improved endometrial assessment after septoplasty

Finally, a better assessment of the factors on which treatment success depends is an important parameter in assisted reproduction. After septoplasty, the appearance and quality of the

endometrium can be better evaluated when a reproductive treatment is indicated (Pace et al., 2013).

III. THREATS

Risk of over diagnosis

The regular use of ultrasound in the gynaecology clinic and the higher resolution of the equipment used together with the addition of 3D technology in the diagnostic work-up for sterility contributes to the over diagnosis of uterine septum, although in most cases it has no clinical implications (Ludwin et al., 2013; Moini et al., 2013). The new ESHRE / ESGE diagnostic criteria further favours this situation by increasing the management problem (Ludwin et al., 2014a; 2015) because the length at which the septum becomes significantly related to the onset of pathology is still unknown (Ludwin et al. Detti et al., 2016). This situation also makes it difficult to evaluate the residual septum after hysteroscopic septoplasty, sometimes leading to unnecessary reinterventions

Risk of over treating.

Sterility can be a result of multiple factors and this makes it difficult to determine whether the diagnosis of a uterine septum is one of the main causes. For this reason, when a sterile couple is offered assisted reproduction techniques assuming that the rate of success is uncertain (pregnancy rates are not a 100%) it would be difficult to stop acting on a problem that could affect them, especially when the treatment is accessible and its risks are reduced (Mairos and Di Martino, 2016). However, this generates the general belief that the uterine septum should always be operated on and lead to unnecessary surgeries in situations that do not cause sterility or poor obstetrical outcome (Aci et al., 1993; Maneschi et al., 1995) . Although the

uterine septum has been identified as the main congenital uterine anomaly associated with a significant decrease in the likelihood of natural conception (Venetis et al., 2014), the possibility of pregnancy after hysteroscopic resection continues to be similar to that of the general sterile population (Grimbizis, et al., 1998)

Risk of no treating

When the clinician adopts a conservative stance (Rikken et al., 2017) to avoid the risks of overtreatment of the uterine septum based on scientific evidence, the risks of not treating will have to be assumed. We cannot forget that many studies associate it with an increase in reproductive pathology (Tomazevic et al., 2010, Practice Committee of ASRM, 2016) and that maintaining it could force subsequent septoplasty after abortion, preterm delivery or simply non-gestation; spontaneous or after assisted reproduction techniques, with the consequent economic and / or emotional cost, as well as a loss of time that could be fundamental in older patients.

Easy access to the internet overriding medical criteria

Nowadays, the internet offers a variety of medical information resources that are frequently used by patients (Bratucu R et al., 2014) as well as by women attempting to become pregnant (Tuil et al., 2008; Kraschnewski et al., 2014), however the information is not always in agreement with the information received directly in consultation and could generate a conflict in the medical-patient relationship if it is not re-discussed between the two parties as reflected by some systematic reviews of internet use in different pathologies (Tan et Goonawardene, 2017) or specifically by pregnant women (Sayakhot et al., 2016). Given the predisposition to medical intervention in our current society, previously analyzed in the Opportunities section, the professional advice of not performing septoplasty could lead the patient to seek additional

information that would lead her to institutions where advertising wouldhave more weight than that of scientistific information (Huang et al., 2005; Jain and Barbieri, 2005; Abusief et al., 2007)

CONCLUSIONS

Clinical evidence from the studies analysed all lean in the same direction and confirms an improvement in reproductive outcomes following hysteroscopic resection of the septum, particularly in infertile women and women with recurrent abortions. However, another set of factors such as current technical advancements available nowadays that make it a safe and simple procedure without need for hospitalization, the predisposition to interventionism, and the societal demand by infertile women to solve any contributing factor that interferes in the possibility of a pregnancy support the trend towards this approach, even if the evidence is questionable. Aspects such as the standardization of the technique and the evaluation of the results favour its use in daily practice. However, confirmation of the clinical benefits and cost-effectiveness of this procedure through well-designed randomized controlled trials still remains increasingly necessary.

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