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Factors Predictive of Uterine Rupture after Operative Hysteroscopy

Z.Khallouk*, S.Bouhache, K.EL Moussaoui, F.Z.Louzali, S.Badsi, N.Zeraidi, A.Baidada

Gynecology obstetrics department .CHU IBN SINA, RABAT, Morocco

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***Corresponding author:** Dr. Zaineb khallouk

Abstract

Objectives: To identify factors predictive of obstetric uterine rupture after operative hysteroscopy. When these factors are present, to know if there are means to prevent subsequent uterine rupture. Finally, to specify the criteria for extracting the fetus before rupture. ***Patients and methods:*** Description of a case of uterine rupture in a patient with a history of uterine septum rupture treated by operative hysteroscopy and retrospective analysis of the 12 similar observations reported in the literature. ***Results:*** Two types of situations are to be differentiated: uncomplicated hysteroscopic ablation of a polyp or submucosal myoma, which does not seem to modify the obstetrical prognosis; metroplasties for uterine malformation, resections of complex synechia, uterine perforations secondary to resection with the use of a monopole section current, constituting situations at high risk of obstetrical rupture. ***Conclusion:*** Uterine ruptures secondary to operative hysteroscopy are rare but serious. They may occur before any labour, and involve the vital prognosis of the mother-foetus. Once the risk factors have been identified, there is no way of preventing the progression to obstetric uterine rupture. The vigilance of the obstetrician in this context must be extreme, trying to authenticate the slightest clinical sign in favour of a pre-rupture of the uterus. However, systematic Caesarean section is not justified.

Keywords: Electrosection - Operative hysteroscopy - Metroplasty - Uterine rupture – Synechia.

INTRODUCTION

Operative hysteroscopy has become the standard treatment for uterine septum rupture, synechia, endometrial polyps and submucosal myomas [1]. Short-term operative morbidity appears to be minimal. The rate of operative complications (hemorrhage, infection, uterine perforation, hyponatremia, acute pulmonary edema) is 2.7% [2]; uterine perforation alone accounts for one third of operative complications [3]. However, the literature reports several documented cases of severe obstetrical complications such as uterine rupture related to a history of operative hysteroscopy [4-14]. Having had experience ourselves of obstetric uterine rupture after operative hysteroscopy, we believe that the obstetric prognosis following HSCO in certain circumstances should be reconsidered. We have tried to identify the factors predictive of the occurrence of such a complication and, if they should exist, to determine the means of preventing obstetric uterine rupture, and lastly to specify the criteria allowing us to extract the fetus before rupture.

MATERIAL AND METHOD

A consultation of the Medline database (keywords: complicated pregnancy, hysteroscopy) allowed us to find 12 cases of obstetrical complications related to operative hysteroscopy. With our own observation, we can draw up a list of 13 cases of documented uterine rupture following operative hysteroscopy, constituting the starting point of our study.

RESULTS

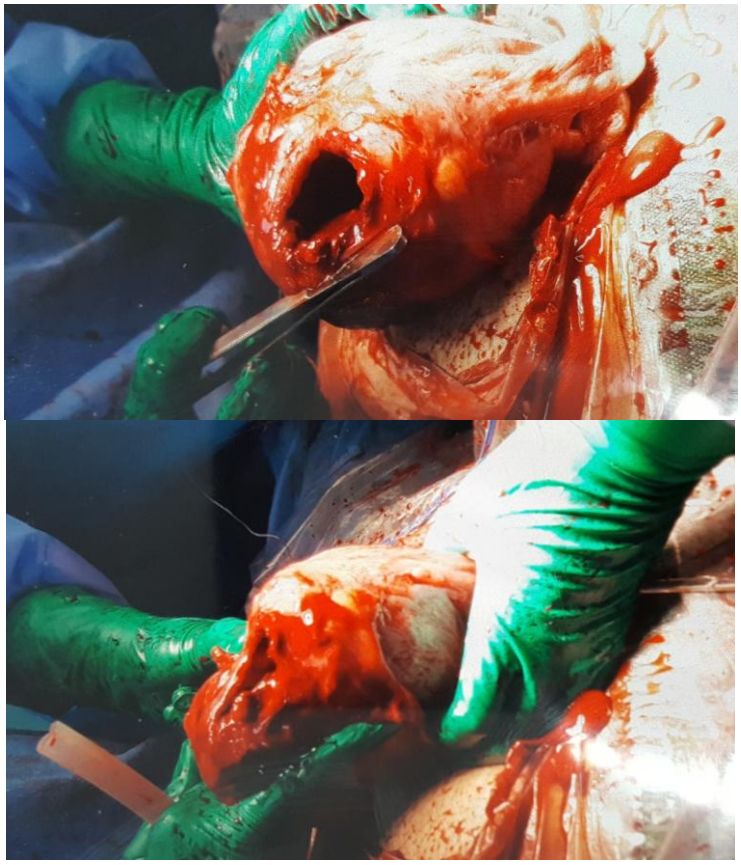
Our observation

Mrs. S. B 29, G3P1 with a history of two spontaneous abortions and whose etiological diagnosis was in favor of a partitioned uterus with the presence of a total partition. The patient underwent a hysteroscopic septal curettage 9 months prior to conception. The pregnancy was well monitored at term. The patient presented to the expectant room of the maternity ward 1 hour after the first uterine contractions had begun.

On general examination: weight: 75 kg, height: 1.66m, T*: 36, 8 c*, BP: 12/06 cmHg, Fc: 79 batt/min.

At the obstetrical examination: the uterine height is 29 cm, regular positive BCF, the vaginal touch found a supple median cervix erased at 80% dilated at 2dgoites, mobile cephalic presentation, intact water pocket. Ultrasonography found a progressive mono-fetal pregnancy, positive cardiac activity, cephalic presentation, posterior placenta, amniotic fluid of normal quantity, BIP : 90mm and LF: 69mm.

During the patient's monitoring in the expectant room she presented a medium to heavy bleeding with decelerations at the RCF, an emergency caesarean section was indicated for suspicion of uterine rupture. At the opening of the peritoneal cavity, the presence of medium-abundant hemoperitoneum was noted, segmental hysterotomy was performed which allowed the cephalic extraction of a live female newborn Abgar 8 -9-10. After the artificial delivery, exploration revealed the presence of a uterine rupture of 3-4 cm in diameter Seat at the uterine fundus midway between the two horns. A conservative treatment was decided for this patient with sutures on the 3 planes of the uterine prey (mucous, muscular and serous) for rupture, then simple hysterography of the lower segment. The patient remained under careful surveillance in the recovery room after transfusion of three red blood cells. The evolution was good, and the patient was discharged at D5 from the postoperative department.



The 12 cases of uterine rupture recorded to date

Twelve cases of rupture of the pregnant uterus after operative hysteroscopy have been reported in the last 20 years [4-14]. These are uterine ruptures following 9 metroplasties for partitioned uterus, 2 synechia resections and 1 submucosal myoma resection. Their characteristics are detailed in Table I. Characteristics of uterine ruptures after operative hysteroscopy.

Table-I: Characteristics of uterine ruptures after operative hysteroscopy

	Indication	Technique of resection	Perforation intraoperative	Laparoscopy of control	HSG of control	Deadline from design	Term of the rupture	Rupture during the work	Death fetal	Death maternal
Creinin *et al.* [11]	Partition uterine	Diathermic Cove in monopole	Yes	Yes	Persistence of a defect	Not communicated	38 SA Caesarean section programmed	No	No	No
Halvorson *et al.* [12]	Partition uterine	Scissors in cold mode	Yes	Yes	NO	1 month	19 SA	No	Yes	No
Howe [6]	Partition uterine	Scissors in cold mode	Yes	Yes	Normal	1 year	33 SA	No	Yes	No
Lobaugh *et al* [7].	Partition uterine	Laser	No	Yes	Remainder of uterine septum	years	32 SA	No	No	No
Yaron *et al.* [9]	Myoma submucous	Diathermic Cove in monopole	Yes	No	NO	Notion of several month	33 SA	No	No	No
Gurgan *et al* [13].	Synechia	Diathermic Cove in monopole	Yes	No	Normal	14 months	36 SA	No	No	No
Tannous *et al.* [10]	Partition uterine	Diathermic Cove in monopole	No	Yes	NO	2 months	39 SA	Yes	No	No
Tannous *et al.* [10]	Synechia	Diathermic Cove in monopole	No	Yes	NO	5 months	41 SA	Yes	No	No
Gabriele *et al* [4].	Partition uterine	Scissors in monopole	Yes	No	NO	11 months	37 SA	Yes	No	No
Chokri *et al.* [18]	Synechia	Diathermic Cove in monopole	No	No	NO	2 years	35 SA	No	Yes	No
Kerimis *et al.* [8]	Partition uterine	Scissors in monopole	No	Yes	NO	3 months	41 SA	Yes	No	No
Angell *et al.* [5]	Partition uterine	Scissors in cold mode	No	Yes	Remainder partition wall uterine	No press release	37 SA	No	No	No
Sentilhes *et al.*	Retention placental	Diathermic Cove in monopole	Yes	No	Normal	5 years	40 SA	Yes	Yes	Or i

DISCUSSION

Risk factors for uterine rupture after operative hysteroscopy:

A Metroplasty for malformed uterus, particularly a partitioned uterus, is a known risk factor for obstetric uterine rupture [15]. 15] The few teams that still practiced this type of surgery by laparotomy in recent years underlined this fact [16]. The malformed uterus would be more fragile, although in the case of a septum it appears similar to the normal myometrium [17]. The apparent simplicity of operative hysteroscopy does not absolve us from this type of complication. In fact, 9 obstetric uterine ruptures out of the 13 cases we report occurred in a context of metroplasty on a partitioned uterus. Uterine perforation during hysteroscopic metroplasties is certainly an aggravating factor in the risk of subsequent obstetric uterine rupture. Of the 9 uterine ruptures after metroplasty, 4 are interested in a perforation at the time of hysteroscopy. However, even in the absence of perforation detected

by laparoscopy coupled with hysteroscopy, the possibility of rupture remains real; 4 of the patients in the series attest to this [5, 7, 8, 10]. One can only wonder about the relevance of laparoscopy coupled with hysteroscopy to detect the perforation or its imminent risk.

Would not ultrasonography combined with hysteroscopy be more effective in assessing the thickness of the residual myometrium and its potential fragility [18]? This question remains unanswered for two reasons: none of the metroplaties in the series has been performed under ultrasound control, and no post-hysteroscopic metroplasty obstetric uterine rupture performed under ultrasound control has been reported in the literature to date. Enlargement metroplasties in the context of Distilbene® uterus should theoretically expose to the same complications.

Considering the obstetrical risk after uterine septum resection and the existence of deliveries at term without obstetrical complications in the case of a septalated uterus, it is not justified, and may even be detrimental, to operate on asymptomatic uterine septum that has been discovered by chance [19, 20].

Severe uterine synechia, whether extensive or conjunctivo-muscular, reproduces a case close to uterine partitions; their resection, which can be likened to an enlargement metroplasty, constitutes a situation at risk of rupture in a future pregnant uterus. Two cases are identified in the series with or without associated perforation [10, 13].

Apart from our observation and that of Yaron *et al*. [9], hysteroscopic surgery of endometrial polyps, submucosal myomas and placental retentions does not appear to be at risk of obstetric uterine rupture. This is not mentioned in the literature. Our observation and that of Yaron *et al*. present the particularity of having complicated a perforation when using a single-polar section current. These two parameters considered independently do not generally have an impact on a future pregnant uterus. On the other hand, the combination of uterine perforation and monopolar section current clearly transforms the obstetrical prognosis of the uterus concerned. After the use of monopolar electric current, the tissue vitality of the underlying myometrium seems unknown. Deep electrical diffusion, which is difficult to control, may be responsible for extensive tissue necrosis.

Therefore, the healing power of the myometrium in case of perforation appears uncertain. A perforation in this context of using a monopole electrode is certainly no longer a simple perforation, but a high risk of subsequent uterine rupture.

Can the risk of obstetric uterine rupture be prevented?

Scissors used alone without power to cut the partitions or synechia do not protect against subsequent rupture [5]. The laser does not protect against this eventuality [7]. Uterine suturing of an identified perforation also does not prevent obstetric rupture [9]. However, cold mode resection and laser resection are preferable to single pole section current [2]. No obstetrical uterine rupture has been reported after the use of these 2 operating modes, without a previous uterine perforation, unlike the monopolar mode. In our observation, it would have been preferable to successfully complete the placental retention cure in cold mode without resorting to the monopolar mode: since the myometrium and endometrium remain fragile in the postpartum period, the use of single-polar section current should therefore be avoided or used only as a last resort during this period, given the major risk of iatrogeny (uterine perforation, synechia, weakening of the uterine wall).

The HSG is not recommended for assessing the strength of the uterus. Carried out 7 times out of 13, it was judged normal 6 times and did not prevent rupture. The control HSG, which objectifies a residual uterine septum, does not provide any additional safety [5]. Endovaginal ultrasonography is an excellent examination to evaluate the thickness of the uterine scar and to detect parietal defects in non-pregnant uteri [21]. However, the value of endovaginal ultrasound for remote monitoring of uterine perforation to identify patients at risk of rupture has not been demonstrated.

Some people recommend, although it is not consensual, waiting at least 6 months after uterine perforation by operative hysteroscopy before starting a pregnancy [10]. Analysis of our 13 observations shows that the time for perforation ruptures is highly variable, ranging from 2 months to 5 years. Lobaugh et al. describe the case of uterine rupture in a second pregnancy, when the patient had given birth normally for the first time after operative hysteroscopy [7]. A long delay after operative hysteroscopy at risk and normal conception or delivery following operative hysteroscopy is therefore no guarantee of subsequent obstetric safety.

Clearly, once the risk factors for uterine rupture have been identified, no precautions can be taken to avoid progression to obstetric uterine rupture.

What would be the criteria for fetal extraction in an identified risk situation?

In order to monitor residual myometrial thickness after operative hysteroscopy and to detect a risk situation, Howe performed a series of ultrasound scans throughout a pregnancy after septal section [6]. Ultrasound scans were normal until the abrupt onset of uterine rupture at 33 AS. Ultrasonography is therefore

not a relevant examination during pregnancy to detect the imminence of rupture.

Caesarean section scheduled at 38 AS does not prevent uterine rupture before this term if there is a history of operative hysteroscopy. For 8 patients, rupture occurred before 38 AS. Systematic Caesarean section is therefore not justified because of the unexpected nature of the rupture, which most often occurs before the patient goes into labor.

The only elements of monitoring therefore remain the clinic and the study of the fetal heart rate. The classic signs of uterine pre-rupture in the context of a patient with a history of operative hysteroscopy should not be minimized at all.

It is essential to retrieve the report of the previous operative hysteroscopy; this must be included in the obstetrical record.

CONCLUSION

Uterine ruptures secondary to operative hysteroscopy are rare but serious, involving neonatal and maternal vital prognosis. The risk factors are clearly identified. They are metroplasties on malformed uterus, complex synechia lifts, and myometrial resections by single-polar section current complicated by perforation. Once these risk factors have been identified, nothing can prevent the evolution towards obstetrical uterine rupture.

The vigilance of the obstetrician in this context must be extreme, trying to authenticate the slightest clinical sign in favour of pre-rupture. However, systematic Caesarean section is not justified. The indications for operative hysteroscopy must be rigorous and concern only symptomatic patients, especially for young women who have a desire to become pregnant. New generation resectors using bipolar current may provide greater obstetrical safety after operative hysteroscopy.

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