

Impact of monopolar and bipolar endometrial resection on abnormal uterine bleeding

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SUMMARY: Impact of monopolar and bipolar endometrial resection on abnormal uterine bleeding.

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Study Objective. To compare two procedures for endometrial resection: resectoscopy with monopolar knife versus resectoscopy with bipolar knife.

Patients and methods. 76 perimenopausal patients affected by DUB (Dysfunctional Uterine Bleeding), no longer wishing to remain pregnant and having failed to respond to pharmacological treatment, underwent endometrial ablation with monopolar loop (group A: 38 women) or bipolar loop (group B: 38 women). Operative parameters, complication rate, menstrual outcome were considered.

Results. Operative time was no different between groups. The amount of distention fluid adsorbed was significantly higher in group A than in group B, and late cumulative complication rate was 44% in group A and 24% in group B. Menstrual cycle was, overall, controlled in both groups.

Conclusions. Bipolar electrode is as effective as monopolar electrode for endometrial resection, but was safer than monopolar knife.

RIASSUNTO: Impatto della resezione endometriale monopolare e bipolare nel trattamento dei sanguinamenti uterini anomali.

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Scopo. Valutare gli effetti a lungo termine della resezione endometriale effettuata con resectoscopia ad ansa monopolare o ad ansa bipolare.

Materiali e metodi. 76 pazienti non desiderose di prole, in perimenopausa, affette da DUB non responsivo a terapia medica sottoposte a resezione endometriale resectoscopica con due tipologie di anse: corrente monopolare (gruppo A: 38 pazienti) e corrente bipolare (gruppo B: 38 pazienti). Sono stati valutati a dodici mesi i parametri operatori, le complicanze immediate e tardive, i parametri mestruali.

Risultati. Non sono state evidenziate differenze dei parametri operatori e delle complicanze immediate tra i due gruppi. Il tasso di complicanze tardive è stato maggiore nel gruppo A vs gruppo B, il ciclo è stato globalmente ben controllato nell'81.1% delle pazienti nel gruppo monopolare e nell'87% delle pazienti del gruppo bipolare.

Conclusioni. La corrente monopolare e bipolare per la resezione endometriale sono parimenti efficaci in termini di outcome mestruale e soddisfazione delle pazienti. La corrente monopolare è gravata da maggiori tassi di complicanze.

KEY WORDS: Endometrial ablation - AUB - Bipolar current - Complication.
Ablazione endometriale - AUB - Corrente bipolare - Complicanze.

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Introduction

Abnormal uterine bleeding is a disorder of menstrual flow which affects approximately 25% of women, occurs in most cases in perimenopausal period and is a common gynecological emergency (1). In 85% of cases, bleeding is not correlated to any organic cause and is defined dysfunctional (DUB: dysfunctional uterine bleeding) (1-3). Medical therapy is generally proposed as a first line intervention; in the case of recurrence or persistence of symptoms a conservative treatment with endometrial resection is often considered feasible (4-6).

Numerous data are available regarding the validity of endometrial resection performed by traditional monopolar resectoscope fitted with a loop, using a non-electrolytic solution to extend the uterine cavity. However, this technique has been associated with serious complications such as mechanical trauma to the cervix, thermal injury and fluid overloading of fluid (7-9). Various non-hysteroscopic procedures have been developed in an attempt to treat DUB that fails to respond to medical treatment (10) but, since these procedures determine the destruction of all endometrial tissue, and therefore do not allow histological diagnosis, they are not in widespread use.

In the last decade, technological advances have led to the introduction of resectoscopes equipped with bipolar electrodes that allow simple and safe treatment of many intrauterine diseases, using saline solution as a means of distention, thereby reducing the risks. In this study, we compared the long-term effects on the menstrual cycle of endometrial resection performed by monopolar resectoscope loop with the effects obtained using the bipolar loop.

Materials and methods

For the study we retrospectively considered patients who had undergone endometrial resection surgery at our unit, from January 2009 to January 2011. The inclusion criteria were: women aged between 42 and 55 years, no longer wishing offspring, suffering from DUB (Dysfunctional Uterine Bleeding) and unresponsive to 6 months of medical therapy.

Preoperative diagnostic workup included: blood tests to rule out systemic and/or hormonal causes of bleeding, gynecological examination and transvaginal pelvic ultrasound to rule out large uterus (> 10 weeks) and concomitant organic diseases of the genital area, pap test, and diagnostic hysteroscopy with

biopsy to exclude endometrial atypical hyperplasia or malignant lesions.

We selected 76 patients, divided into two groups, in relation to the current used:

- Monopolar current cutting-loop connected to a generator set to pure shear 60-80 watts (38 patients: group A).

- Bipolar current cutting-loop connected to a dedicated electric generator (Autocon II 400, Storz) set to "Saline large loop" with a bipolar current C-CUT, with effect of depth of cut 5/8 (38 patients: group B).

All operations were performed in the early proliferative phase, without any pharmacological preparation, under spinal anesthesia, in day-hospital. Resectoscope used in both groups was 26 French in diameter, with optic 0°. Means of distension used was urologic solution of sorbitol-mannitol (sorbitol 2.7 p/v, mannitol 5.4 p/v) in group A and physiological saline (0.9% p/v NaCl) in group B, at a constant flow pressure of 70-90 mmHg, guaranteed by an infusion squeezing bag connected to a sphygmometer to measure blood pressure, positioned at a height of 90-100 cm above the perineum. In all patients, the cervix was dilated with Hegar series to allow insertion of the resectoscope. Surgical technique involved total resection of the endometrium in depth and in extension, along the superficial portion of the myometrium (2-3 mm) to ensure the removal of deep glandular recesses. Fluid balance was recorded by measuring fluid administered and fluid drained during resectoscopy. For this, we used graduated plastic bags to quantify fluid administered; hysteroscopy flow was connected to a suction unit to collect the fluid in plastic bags placed in cylindrical containers, with volume indicated. The liquid drained from the vagina was collected in graduated plastic bags placed immediately below the perineum of the patient, to prevent loss of fluid on the sheeting delimitation of the operative field. At half hour intervals, at the change of each graduated bag and at end of operation, a form was filled out recording fluid flows so as to quantify the quantity of liquid absorbed.

Serum sodium levels were monitored in patients with fluid absorption > 1000 ml, or in the case of operative time more than 30 minutes. Protocol provided for discharge within 12 hours after surgery. Post-operative follow-up included a hysteroscopic test carried out 6 months after operation. All specimens collected were sent for histological examination.

For all patients the following parameters were recorded:

- Surgical parameters: operative time (operation time was calculated from initial introduction of re-

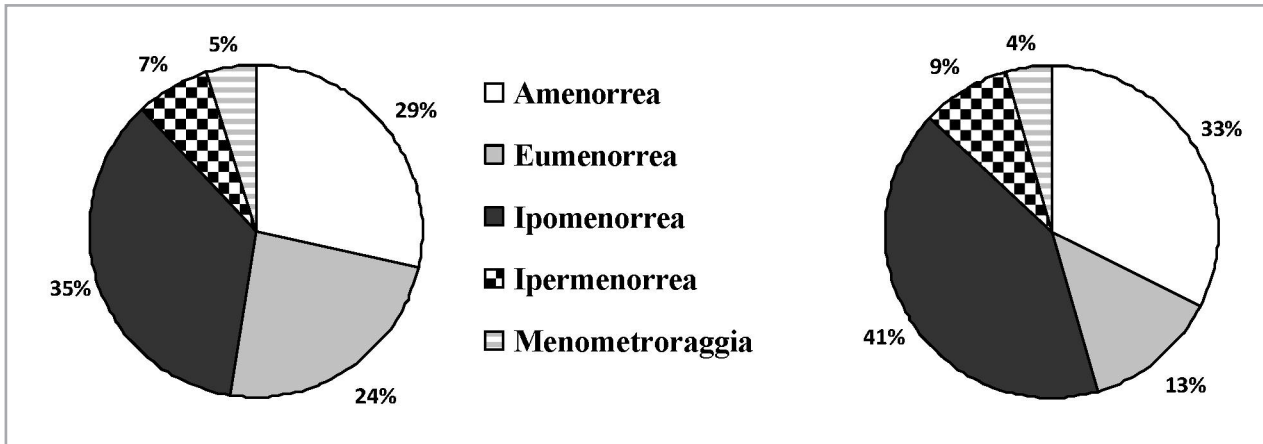


Figure 1 - Menstrual follow-up: flow characteristics.

sectoscope to final removal), fluid absorption, intra- and post-operative complications, both immediate (intraoperative poor visibility, cervical lacerations, uterine false passages, uterine perforation, fluid overload, thermal damage, significant intraoperative bleeding) and later (post-operative pain, hospitalization of more than 12 hours, intrauterine synechia).

- Menstrual parameters: flow characteristics before surgery and after 12 months (amenorrhea, hypomenorrhea, hypermenorrhea, eumenorrhea, less breakthrough bleeding, spotting, clots, dysmenorrhea), need for medical treatment after operation, need for second operation (new resection, hysterectomy).

In addition, patients were asked to give an overall judgment (not satisfied, dissatisfied, satisfied, very satisfied) on the operation to which they were subjected.

TABLE 1 - IMMEDIATE AND LATE COMPLICATIONS.

	GROUP A 38 patients	GROUP B 38 patients
IMMEDIATE		
Poor intraoperative visibility	1	3
Cervical lacerations	1	1
False uterine passage	0	0
Uterine perforation	0	0
Fluid overload	1	0
Thermal damage	0	0
Significant ineraoperative bleeding	1	1
LATE		
Post-operative pain	4	5
Overnight stay	6	2
Intrauterine synechia at 6 months	4	1

Results are reported as the mean ± SD. Statistical analysis was performed using unpaired Student's t-test, chi-square or Fisher test when appropriate. P <0.05 was considered statistically significant.

Results

Both groups were similar in terms of range of age, parity and body mass index (BMI).

Duration of operation was between 14-37 minutes (average 25.5 min) in group A, and between 16 and 42 (average 29 min) in group B, without statistically significant differences. Quantity of distension liquid absorbed by patients undergoing monopolar resectoscopic resection was between 410ml and 1520ml (average 755.2±260.6) and was significantly higher than that absorbed in the group using bipolar resectoscopy (220-1250 ml, 685.2±240.4).

Immediate complication rate (Table 1) was similar in both groups. In no case was it necessary to interrupt the operation. Only one case of fluid overloading was seen in group A associated with hyponatremia which required intensive treatment and extension of hospitalization to four days. Late complication rate was 36.8% in group A and 21% in group B (Table 1). In particular, post-operative pain was significant and required administration of painkillers in 4 patients from group A and 5 from group B; 6 patients from group A and 2 from group B requested overnight in hospital.

At 6 months follow-up, hysteroscopic control was performed; 4 cases of synechia were reported in group A and 1 case of synechia in group B. The final pathology report showed no cases of atypia in any patient. Data on menstrual outcome are available only for those women who underwent the 6

month check-up (Figure 1): 21 in group A and 23 in group B. Menstrual flow was, in general, well-controlled (amenorrhoea, hypomenorrhoea, eumenorrhoea) in 81.1% of patients in group A, and in 87% in group B, with no statistically significant differences. Dysmenorrhoea was reduced in group A from 28% to 9.5% and in group B from 24% to 13.1%. Two patients in group A and three in group B required medical therapy to control bleeding after the operation. Overall, the procedure satisfied the vast majority of patients in group A (85.3%) and group B (89.1%).

Discussion

Data available in literature (4, 5, 8, 10, 11) with regard to the use of resectoscopy with monopolar electrical loop for endometrial resection show globally satisfactory results in terms of effectiveness, with a rate of normalization of the menstruation cycle in five consecutive years ranging from 75% to 85%. However, the technique is burdened by variable rates of dangerous complications related to the type of current (thermal damage) and to the characteristics of the medium of distension (intravasation) (9, 12-14). Recent developments in technology have led to the introduction of the endoscopic bipolar resectoscope (13, 15-17) which has improved the safety of the procedure, as it uses a saline solution, avoiding problems resulting from dispersion of energy and possible hyponatremia.

Notwithstanding this, there are no available data comparing endometrial resection procedures with mono and bipolar resectoscopic techniques, nor long-term follow-up on the bipolar technique.

Our results indicate that the use of bipolar resectoscope with loop has the same efficacy as monopolar resectoscope but offers some advantages, regarding operating parameters and safety. In group A, there was a higher absorption of fluid compared to group B, and there were one cases of fluid overloading syndrome associated with hyponatremia. As is known, in cases of fluid overloading with urologic solution, there are serious risks associated of hyponatremia, that is a clinical condition characterized by the reduction of the value of serum sodium (<135mEq/litro); by contrast, the saline solution used with bipolar energy avoids the risk of hyponatremia in case of overload of fluids as it has a concentration of ions similar to that of human plasma. However, the technique is not free from the risk of excessive absorption of fluids, and thus, the amount of liquid used must always be carefully monitored and recorded (18).

With regard to hemostasis, the bipolar technique was as effective as the monopolar. In our experience, a significant intraoperative blood loss occurred in two cases of group A and in one in group B, although the operation was not stopped. It should be noted that the use of bipolar current can cause the formation of troublesome bubbles in the cavity that hinder vision and require appropriate maneuvers to be removed; this can potentially affect the duration of the intervention. In all probability, a slightly higher trend in longer operating times in group B could be related to this phenomenon.

An interesting aspect is the increased risk of intrauterine synechia related to the two techniques (14, 19, 20). It has already been speculated that one of the benefits of the bipolar approach is the lower risk of thermal damage of myometrial vessels compared to the monopolar approach, and less weakening of tissue due to reduced diffusion of energy through the same tissue. In this regard, studies on resectoscopic myomectomy showed a prevalence of post-operative synechia of about 30% in the case of use of monopolar technique (21) compared to 10% with the bipolar technique. Taskin et al (22) report a rate of synechia after hysteroscopic myomectomy with monopolar current of 31.3% for solitary myomas and 45.5% for multiple myomas. Guida et al (23) showed a rate of synechia of 26.1% after hysteroscopic resection with bipolar current of 65 patients with myomas, polyps and/or septa. Overall, these data suggest that the incidence of intrauterine synechia after hysteroscopic resection with bipolar current is lower than that recorded with monopolar current. Future studies on microscopic and ultra-structural data should evaluate the possibility that the bipolar electro-surgery can lead to different re-epithelialization of the surface of the myometrium.

The data on menstrual follow-up showed that both currents are effective in the treatment of abnormal uterine bleeding. In over 80% of cases, the bipolar technique has proved capable of improving symptomatology with a low rate of use of new medical therapies and/or second surgery. The satisfaction of the patients who underwent treatment of abnormal uterine bleeding by bipolar or monopolar endometrial resection is in agreement with our clinical results and reflects literature data (24).

In conclusion, although endometrial resection performed with bipolar current does not show superior benefits over the current unipolar approach in terms of menstrual results and patient satisfaction, higher levels of safety make bipolar resectoscopy an invaluable, valid alternative to monopolar resectoscopy and should therefore be favoured. Howev-

er, in choosing the technique, cost and availability of instruments should be taken into consideration. Monopolar technology offers the advantage of being

less costly and easily carried out, while bipolar hysteroscopy requires dedicated instruments at a higher cost and which are less easily available.

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