



HYSTEROSCOPIC RESECTOSCOPE- BIPOLAR IS THE WAY FORWARD

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ABSTRACT

Hysteroscopy is the gold standard for evaluation and treatment of a wide range of uterine pathologies. The trend in the different types of hysteroscopic surgeries have experienced a significant change with shift from monopolar to bipolar and now use of exclusive Bipolar resectoscope. The following retrospective study examines the use of and efficacy of bipolar technology in management of uterine pathology with comparison to monopolar resectoscope, the advantages and disadvantages of the same. **Method-** Retrospective observational study was conducted from January 2010 to 2013 in patients who underwent bipolar resectoscopic surgeries for various uterine pathologies and the results were compared with retrospective data collected from 2006 to 2009 in patients who underwent monopolar resectoscopic surgeries for the same indications. The data was maintained, compiled and analyzed. **Result-** All resectoscopic surgeries can be done with bipolar technology with same efficacy as monopolar. Bipolar technique eliminates the need for hypo-osmotic glycine use giving an excellent safety margin and allowing an extra fluid deficit. **Conclusion-** Bipolar current use is safe in comparison to monopolar giving an improved patient outcome in terms of complication and post operative recovery.

KEYWORDS

Bipolar Resectoscope, Monopolar Resectoscope, Fluid Deficit, Complications, Operative Time

INTRODUCTION

Hysteroscopy, today is considered gold standard for evaluating and treating many a pathology with in the uterine cavity (1). Till a decade ago, the standard operative hysteroscopic surgery included monopolar resectoscope that used the monopolar current, and the distension medium used for such surgery had to be a nonelectrolyte solution. 1.5% Glycine was the commonest media used for this purpose, with its inherent complications like hyponatremia, hypo-osmolality, hypervolemia, brain oedema and even death.

Today with the introduction of smaller telescopes, sheaths, office hysteroscopy has become an exciting and rapidly advancing field. Office based operative hysteroscopy has already demonstrated good correlation of findings compared with inpatient hysteroscopy, providing distinct advantages such as reduced anesthesia risks, enhanced time- and cost effectiveness, and faster recover with less time away from work and home (2). For office hysteroscopy, normal saline is the distension media used, which is compatible for versa point bipolar electrodes, whenever energy is required. Those surgery wherein larger diameter resectoscope is required can be termed as resectoscopic surgery.

With the advancement in bipolar current, a new generation of resectoscope with all the type of electrodes similar to the one used in monopolar resectoscope have been introduced. This bipolar resectoscope can be used with normal saline as the distension media, thereby avoiding the use of glycine and all its complications and since the electrodes are also close to each other the chances of tissue burns will be less (3). But the cutting efficiency of bipolar energy was always doubted in comparison to monopolar resectoscopic surgery. (4)

The objectives of the present study were to examine whether all resectoscopic procedures can be performed using bipolar technology, with the same efficiency as monopolar resectoscopic surgery, and to determine the complications associated with bipolar resectoscopic surgery and compare the same with the complications of monopolar resectoscopic surgery.

AIMS AND OBJECTIVES

To study the effectiveness and complications of Bipolar and Monopolar resectoscopic surgeries

Inclusion criteria-

1. Women presenting with subfertility and infertility

2. Women presenting with pre and post-menopausal heavy menstrual bleeding
3. Women presenting with abnormal uterine bleeding with uterine pathology opting for preservation of fertility

Exclusion criteria-

1. Women presenting with heavy menstrual bleeding not willing for hysteroscopic intervention.
1. Women with abnormal uterine bleeding opting for hysterectomy

MATERIAL AND METHODS-

Retrospective observational study was conducted among 1,408 patients who presented to the center fulfilling the inclusion and exclusion criteria. From January 2010 to December 2013, 820 women were included in the study group who underwent resectoscopic surgery using bipolar technology at two private endoscopic surgical centers, all the surgeries done by the same surgeon who has been performing hysteroscopic surgery since 1999. The control group composed of 588 women, who had undergone resectoscopic surgery between January 2006 to December 2009 using the monopolar technology, before the bipolar technology was adopted at study center. The patients included women who visited the center for subfertility or for abnormal uterine bleeding. Patients with abnormal uterine bleeding included pre and post-menopausal patients.

All the patients had undergone complete preoperative investigations for anesthesia fitness. Patients with abnormal uterine bleeding were subjected to vaginal cytology also. Among the patients with abnormal bleeding only those patients opting for preserving their uterus were included and taken for hysteroscopic management.

Retrospective data of the study and the control group were obtained from the records of surgery between 2010-2013 and 2006-2009 respectively

Surgical Technique

All the procedures were done under general anesthesia with complete monitoring. Patients were given a single dose of 1 gram Cefotaxime preoperatively after test dose. All the procedures were done by the same surgeon using the 9mm bipolar resectoscope from Karl Storz GmbH with normal Saline as distension medium. The electrodes (24F) used were either Collins knife or the loop electrode as per requirement. The bipolar energy generator used was Erbe Vio 300d with company settings of bipolar cut 4-5. The same ESU was used during the period when monopolar technology was used with current settings of pure cut

of 90 W. With saline medium the protocol to stop the procedure was when the fluid deficit of 2 liters was reached. All the procedures were done with HD imaging systems and were video recorded.

RESULTS-

The patients presented to center with complaints of infertility were 83% and abnormal uterine bleeding were 17% (Table 1)

Table – 1 Distribution As Per Presenting Symptoms

PRESENTING SYMPTOMS	BIPOLAR SURGERY (N=820) n (%)	MONOPOLAR SURGERY (N=588) n (%)
Infertility	680 (83%)	488 (83%)
Abnormal uterine bleeding, premenopausal	84 (10%)	63 (10.7%)
Abnormal uterine bleeding, post menopausal	56 (7%)	37 (6.3%)

As per patient complaints, the type of procedure performed as shown in table 2 showed no statistical difference between the two groups as far as characteristics and procedure performed are concerned

Table – 2 Distribution As Per Procedure Performed

PROCEDURE PERFORMED	BIPOLAR SURGERY (N=820) n (%)	MONOPOLAR SURGERY (N=588) n (%)
Septoplasty	356 (43.4%)	261 (44.3%)
Adhesiolysis	197 (24%)	145 (24.6%)
Polypectomy	174 (21.2%)	122 (20.7%)
Myomectomy	66 (8%)	43 (7.3%)
Polypectomy + Myomectomy	11 (1.3%)	8 (1.3%)
Lateral Metroplasty	16 (1.9%)	9 (1.5%)

A total of 820 bipolar resectoscopic procedures were performed in the study group. The overall complication in the bipolar group was 4.6%, which compared well with the monopolar group which was 5.7% as seen in Table 3

Table – 3 Distribution As Per Complications

COMPLICATIONS	BIPOLAR SURGERY (N=820) n (%)	MONOPOLAR SURGERY (N=588) n (%)
INTRAOPERATIVE COMPLICATIONS		
False Passage	5 (0.5%)	6 (1%)
Perforation only	4 (0.5%)	3 (0.5%)
Perforation + Laparoscopy	2 (0.25%)	0
Bleeding	5 (0.5%)	2 (0.35%)
Technical difficulties	5 (0.5%)	2 (0.35%)
Anaesthesia related	0	1 (0.17%)
Media Related	4 (0.5%)	8 (1.3%)
POST OPERATIVE COMPLICATIONS		
Fever	5 (0.6%)	4 (0.7%)
Pain	4 (0.5%)	7 (1.2%)
UTI	5 (0.6%)	3 (0.5%)

The incidence of mechanical complications (false passage, perforation) was only 0.5%. Technical problem, in the form of malfunctioning of bipolar electrodes had occurred in 5 patients, where in monopolar resectoscope was used and procedure completed. Excess bleeding which occurred during the procedure were controlled by hysteroscopic technique only in 3 patients and by foley catheter balloon tamponade in 2 patients. Out of the total 6 patients who had perforation, only 2 needed laparoscopy to identify the site of perforation and inspect any visceral damage. In 3 of the patients the procedure was abandoned and the procedure completed 3 months later. All patients were observed for 24 hours and recovered without any post-operative morbidity.

The fluid deficit observed in both groups was about 1.5-2 liters and were treated with just diuretics and no pulmonary oedema. The maximum time required to complete procedure was taken by Myomectomy which was 55 minutes, though the average time to complete the procedure was little longer in the bipolar group (30-55minutes), compared to the monopolar group (25-45 minutes) as seen in table 4.

Of the 22 patients who had difficult myoma resection (submucous myoma >3cms or 2 more myomas), 2 patients had a second procedure done after 8 weeks to complete the procedure as they had exceeded the permissible fluid deficit of normal saline.

The fluid deficit was slightly more in the bipolar group, though both the difference was not statistically significant. The incidence of endometrial hyperplasia in the endometrial polyps was 2.5% and the incidence of premalignant or malignant changes was 2.9%.

Table – 4 Distribution As Per Operating Time And Fluid Deficit

	BIPOLAR SURGERY (N=820)	MONOPOLAR SURGERY (N=588)
Operating time	35-55 minutes	25-45 minutes
Total Media infused (liters)	6-10	4-8
Fluid deficit (ml)	1000- 2200	600- 1700

DISCUSSION-

Hysteroscopy has come a long way since its introduction. Today with the advances many a hysteroscopic procedures can be completed without the need of larger diameter resectoscope, by using smaller specially designed sheaths which allow the introduction of 5 fr scissors and graspers. Other advantage of operative hysteroscopy with smaller diameter sheaths is one can use normal saline as distension media and completed in outpatient settings. Whenever energy is required to be used, one can use versa point electrodes with versapoint bipolar system. But whenever there is a technical limitation of using smaller diameter instruments for doing an efficient job, the use of resectoscope is required to complete the surgery efficiently and reduced operating time. The earlier available monopolar resectoscope is an excellent tool for all hysteroscopic surgery. But since monopolar current is used with monopolar resectoscope, the irrigation fluid used had to be a nonelectrolyte solution. Most often, glycine 1.5%, sorbitol 3% or mannitol 5% were used for this purpose. In India, 1.5% glycine was used as this was available freely. Fluid overload which is inherent to hysteroscopic surgery, resulting in hyponatremia, hypo-osmolality, brain oedema, ammonia toxicity and even death have been reported during hysteroscopic surgery (4). This was a major reason for hysteroscopy not being adopted by many surgeons, in their armamentarium in Gynecology. Though bipolar technology was available in the form of versapoint system from Gynecare, the prohibitive cost and non-sturdiness of the versapoint disposable electrodes, limited its routine use. Since about last decade bipolar resectoscope has been introduced with 3 types of electrodes: Knife, Loop and ball point, which can be used with either isotonic normal saline or Ringer's lactate with bipolar current.

The present study indicates that all resectoscopic surgery can be done with bipolar technology with the same efficiency as monopolar resectoscopic surgery. Both the types of resectoscopic surgery are safe with similar complication rate. Of course, the surgery in this series was done by the same experienced surgeon, and all the guidelines for hysteroscopic surgery were strictly implemented. The possibility of operating with isotonic saline, eliminating the need of using hypo osmotic glycine solution in monopolar surgery, gives excellent safety margin in bipolar surgery, which is advantageous to both experienced surgeon and a beginner. Nevertheless, complication related to fluid overload and pulmonary oedema cannot be avoided. In the present study it can be seen that we were little liberal in allowing extra fluid deficit up to 2.2 liters as isotonic normal saline was used, which with the use of glycine was more strict and restricted to 1.7 liters. One possible explanation for the extra media requirement during bipolar myoma resection could be explained by the slight decreased efficiency in cutting of tissues by the bipolar loop in comparison to monopolar current. Other hazardous complications, like air and gas embolism, and anaesthesia related complications can occur with any surgical procedures. These can be minimized to great extent if proper pre and intraoperative care is taken with monitoring and all safety guidelines

for hysteroscopic surgery is strictly followed. Although there was a claim that gas emboli might occur more often with the use of bipolar hysteroscope, studies have shown that the rate of gas production seems to vary little with the electrosurgical method used (bipolar or monopolar) (5-7).

In the light of present study, we can ask as to why monopolar technology is still being used in hysteroscopy. Our data and a similar study (8) indicate that both monopolar and bipolar techniques are feasible and safe. Both definitely require strict fluid balance, but the bipolar technology has eliminated the need to use hypotonic solutions as irrigation media, with its life-threatening complications. But even with saline solution the risk of pulmonary oedema, still exists and strict supervision of fluid balance should be maintained. With use of saline solution fluid deficit of 2.5 liters can be permitted without any serious complications in healthy individuals (9).

Current Trends In Resectoscopic Surgery

In a further prospective study conducted at our institute from 2016 to 2020, among 746 women coming with complaints of heavy menstrual bleeding and infertility managed by hysteroscopic scissors, bipolar resectoscopic surgery and bipolar Collins knife, it was observed that women managed with Bipolar energy source had an average time of 5-10 minutes, minimizing the operative time. The fluid deficit with bipolar energy source is observed to be <500 ml thus decreasing the complications of fluid overload, electrolyte imbalance and cerebral oedema significantly. The complications associated with bipolar resectoscope surgery is also reduced with the risk of perforation of only 0.13% and fluid overload of 0.8%. the complication of infection, electrosurgical injury, embolism and vasovagal reaction were seen to be nil.

CONCLUSIONS

Bipolar current is thus seen to be safe in comparison to monopolar current; causing significant improvement in patient outcome in terms of complications and post operative recovery. Hence, we believe that today bipolar resectoscope should be preferred in resectoscopic surgery.

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