

## Microbiological Examination of Intrauterine Catheters Tips After Operative Hysteroscopy

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### Abstract

Intrauterine catheters have been used widely to prevent intrauterine adhesions and to secure hemostasis after hysteroscopic surgery. The presence of a balloon inside the uterine cavity with the catheter shaft in the vagina may be a risk factor for ascending infections. Urinary bladder infections following catheterization and ureteric stents bacterial colonization have been known for many years. In the current study 57 Foley's catheter tips were swabbed for microbiological examination after their removal from the uterine cavity 5-7 days after hysteroscopic surgery. Culture for both aerobic and anaerobic bacteria was done as well as sensitivity tests for different antibiotics. 41 cases (71.9%) showed positive bacterial culture; 18 of them proved to be *Escherichia coli* (43.9%). Other isolated bacteria included Beta hemolytic group B *streptococci* (10 cases, 24.4%), group D *streptococci* (5 cases, 12.2%), *Klebsiella pneumoniae* (3 cases, 7.3%), *Pseudomonas aeruginosa* and *Proteus* species (5 cases, 12.2%) and one case of *Candida albicans*. Resistance to commonly used antibiotics was reported in 39 cultures (95.1%), including all 18 *Escherichia coli* cases. This small auditing study showed that intrauterine catheters used after hysteroscopic surgery might carry a risk of causing ascending infections. Accordingly, such practice has been halted in our clinic as clinical or even subclinical uterine or tubal infections may reduce the fertility potential of young women who are keen to conceive.

**Keywords:** Hysteroscopy; Intrauterine catheters; Infection risk

### Introduction

Hysteroscopic surgery is widely used for incising intrauterine septa, excision of intrauterine adhesions and for submucous myomectomy. However, there is a risk of adhesions formation after surgery which could be reduced or prevented by intrauterine balloon application at the end of the procedure [1]. With the foreign balloon in the uterine cavity, and the catheter stem in the vagina, there is a possible risk of ascending infection especially with the raw intrauterine surface after surgery. This may create a different problem as many of these patients are young women who might not have completed their families. Interestingly, the same study by Amer et al., [1] showed no clinical evidence of any pelvic infection and no bacteriological contamination after examination of endocervical swabs from 32 patients included in the study. They cut the catheter shaft after tying it below the balloon so that no part was hanging into or out of the cervical canal into the vagina. However, the authors did not report microbiological examination of the catheters' tips in the same study. On the other hand, a urological study showed bacterial colonization of bladder catheters and ureteric stents, with 45% of the stents so affected [2]. In the same study bacteriuria was found only in 21% of the patients, with *Escherichia coli* being the common organism isolated from both the stents and urine. Accordingly, absence of growth in urine culture did not rule out colonization of the stent itself. The same may be true for negative endocervical swabs results relative to positive intrauterine balloons microbiology. Such bacterial colonization was thought to be due to contamination during insertion or secondary to the fluid used to keep the catheters *in situ* in an obstetrics study [3].

Difficulty in gynaecological practice rises from the fact that vaginal or even endocervical microbiology may not represent upper genital tract bacteria. Secondly, even subclinical infection of the uterine cavity may impact negatively on the fallopian tubes. This may lead to fertility issues in young women who desire to conceive.

The aim of the current study was to test the tips of intrauterine catheters used after hysteroscopic surgery for aerobic and anaerobic bacteria during auditing the safety of this technique in our clinic.

### Brief Report

In this study 57 intrauterine Foley's catheter tips were immediately swabbed for aerobic and anaerobic cultures after their removal 5-7 days following hysteroscopic surgery. All patients were covered with *metronidazole* and *ciprofloxacin* during surgery and for the following 5 days. None of the patients had any active pelvic infection before surgery. Size 14 Foley's catheters were inserted into the uterine cavities following hysteroscopic surgery in theatre under aseptic conditions. Each balloon was inflated with 8-10 ml saline. The catheters were plugged with sterile pigots and attached to the thigh with broad adhesive. Great care was taken not to touch the vaginal wall during removal of the catheters. The swabs were sent immediately to the laboratory with the necessary information regarding the antibiotics used. Analytical Profile Index Kits by Biomerieux SA, (376 Chemin De l'Orme, Marcy l'Etoile, 69280 France) were used for bacterial culturing.

### Results

41 cases (71.9%) showed positive bacterial cultures; 18 of them proved to be *Escherichia coli* (43.9% of the positive cases). Other bacteria isolated included Beta haemolytic group B *streptococci* (10 cases, 24.4%), group D *streptococci* (5 cases, 12.2%), *Klebsiella pneumoniae* (3 cases, 7.3%), *pseudomonas aeruginosa* and *Proteus species* (5, 12.2%) and *candida albicans* (1 case). Antibiotics resistance was reported in 39 cases (95.1%) including all patients who had *Escherichia coli*.

### Discussion

This small auditing study showed that intrauterine catheters used

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after hysteroscopic surgery may carry inherent infection risk. Both overt and subclinical infections may have adverse effects on the fertility potential of young women with fertility aspirations. Interestingly, *Escherichia coli* proved to be the most common organism, like what has been reported before [2]. The high antibiotics resistance in this study might reflect prior misuse of these drugs.

A second urological study confirmed that not all bacterial species colonizing the intraluminal surface of bladder catheters were detected in urine samples [4]. The authors suggested that such catheters' bacterial colonization could precede the emergence of bacteruria. This could also be the scenario for absence of any significant bacteria in endocervical swabs in relation to later endometrial and tubal infections.

One study showed that bladder catheters impregnated with minocycline and rifampin significantly reduced the rate of gram-positive catheter-associated bacteriuria. This lasted for 2 weeks after catheters insertion [5]. Using such technique will not solve our problem as the majority of organisms isolated during this study were gram negative antibiotics resistant bacteria.

## Conclusion

The high incidence of bacterial colonization of intrauterine catheters in this study did not tally with the lack of any significant infections as previously reported in two studies [1,2]. However, in both studies catheters' tips were not examined for bacterial colonization.

The very high bacterial antibiotics resistance is even a bigger problem which may add further cost because more expensive antibiotics will be needed in case of infections. It is advisable that other units in the area using such catheters should carry a similar audit in case they have similar results. Currently intrauterine catheters use has been halted in our practice pending further arrangements. May be the technique used by Amer et al., [1] mentioned above could be the answer as no catheter stem was left hanging down the vagina. However, because of lack of catheters' tips culture in their report, it is necessary that we perform another auditing study in our unit to satisfy this provision before adopting the technique.

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