NEW DEVELOPMENTS IN HYSTEROSCOPY

Christian Sánchez Boccacio*

“Those who fall in love with practice without theory are like sailors without rudder or compass, never know where they go.”

Leonardo Da Vinci (1452-1519)

Hysteroscopy has become a tool commonly used in gynecological consultation thanks to advances now can make the diagnosis and treatment of some of the endocervical and intracavitary pathologies such as small polyps, fibroids or performing tubal sterilization in a single office visit (see and treat), preventing access to an operating room.

New developments have also impacted the technology instrumentation and equipment used to perform a hysteroscopy. As for the optical, are increasingly thin and will generally vary between an outer diameter of 3 to 4 mm, but have now designed rigid endoscopes with diameter of 1.9 mm. These devices have several separate lenses but have a system of optical fibers, which is why they give a view of lower quality of the cavity, with low contrast and resolution because the
image is the result given each fiber separately. In both types of optical systems, fibers or lenses, the vision is monocular, causing a slight distortion in perceived depth.

In 2013 developed hysteroscopes all-integrated systems, with optics, lighting through LED and camera with digital sensors, making these equipments much more versatile, as are the Invisio® (Gyrus / Acmi / Olympus / Tokyo, Japan) and EndoSee® (EndoSee Corporation)\textsuperscript{1} that will be well accepted by gynecologists.

For decades they tried to produce equipment for use on hysteroscopic sterilization without much success, until the arrival of the Essure® (Conceptus, Mountain Wiew CA, USA) which is on the market for more than 10 years. The system comprises two microinserts for bilateral tubal occlusion and are placed using a disposable release system, after viewing the tubal ostia. Despite having an effectiveness of 99.7% after five years of use, in most studies, it has a disadvantage when compared with the laparoscopic technique is that the patient should perform a radiological evaluation (hysterosalpingogram, Abdominal Rx or transvaginal ultrasound) at 3 months to confirm the obstruction of fallopian tubes. Recently it has endorsed its use in patients with presence of hydrosalpinx infertility warranting assisted fertilization procedures like in vitro fertilization (IVF) and intracytoplasmic sperm injection (ICSI).

Another method developed for tubal sterilization was the Adiana® (Hologic, Berford MA, USA) based on the intratubaric growth of a matrix of silicone after an intraluminal electro cautery, but was withdrawn from the market because it violated patent rules and also due to low sales. Hi Tech development in the future will bring us safely, sterilization techniques that obstruct the tube immediately without confirmatory imaging studies.

Hysteroscopic resectoscope in an instrument used in surgical procedures of greater complexity and in that it must be an advanced degree of training, energy is used, either monopolar or bipolar, to make the cuts in long strips of tissue resected, which should be removed, as they begin to obscure the view of the
operative field, being necessary to remove and reintroduce all equipment into the cavity several times, increasing the chance of complications.

Recent advances in resectoscopy are based on the reduction of the caliber of the equipment, which is usually 7-9 mm, which makes it imperative to perform the dilation of the cervix for its introduction. Another of the most popular developments has been the use of bipolar energy and electrodes adapted for this purpose, offering greater security, because it allows the distention of the cavity with saline solution, with a better safety profile compared to the use of non-electrolytes solutions or monopolar energy, which should be used exclusively for non-electrolyte solutions. One disadvantage which is assigned to the bipolar output power is the gas bubbles which obstruct the visual field and gaseous emboli may occur, though in a very low proportion. No major advances in the use of laser energy, since has no advantage over electrosurgery and are more expensive and a greater potential risk, so its use is almost disappearing

Hysteroscopic morcellators:

The tissue that has been removed from the uterine cavity must be extracted, with the use of tweezers or the handle prehension electrode, in the case of resectoscope, since they hinder the view of the operating field is necessary, in some cases the introduction and repeated removal of hysteroscope or resectoscope, increasing the chance of complications.

The hysteroscopic morcellator is a new advance in operative hysteroscopy, including the so-called TRUCLEAR™ (Smith and Nephew, Andover MA, USA) that can solve these aforementioned difficulties. This technique is based on an instrument that consists of two rigid cylindrical pipes, one fitted into the other. The internal, as cutting tool, rotates within the outer, at a certain speed, this movement is given by an electrical control unit, operated by a pedal, which activates and controls the direction of rotation. Both tubes are holes with cutting edges at the distal portion that cut or "shave" the tissue as it rotates, by suction continuously outward from the cavity towards a collecting container which is sent
for pathologic examination. This system does not use electrocoagulation, so there is no risk derived by dispersion of energy. This 4 mm morcellator is introduced into a special hysteroscope for the same commercial House, measuring between 8-9 mm in diameter, so it deserves in almost all cases dilation of the cervix. Recently the thinnest TRUCLEAR ™ system of 2.5 mm for resection of small polyps or fibroids as an office procedure is available. This device has some benefits, one of them is that it does not need a very long learning curve, as with the resectoscope, and as a disadvantage is that you need a special use hysteroscope.

New morcellators systems are available, such as the MyoSure® (Hologic®, Berford MA, USA) and other similar designed by other trading houses. It is necessary to note that there are ongoing lawsuits, between different designers, for infringing patents which could in the future, remove the availability of these new devices.

Virtual Hysteroscopy:

This new technique is based on the realization of a modified sonohysterography with instillation of special gel inside the cavity, with adequate distension, ultrasounds are performed in two or three dimensions in real time, creating images almost equal to diagnostic hysteroscopy, with less pain and discomfort for the patient. The latest in this field is in the progressive change of a medium in the form of gel during dilution into a foam (HyFoSy)₂ that is sufficiently fluid to pass through the fallopian tubes that can be observed in patients with infertility.

In summary, new developments will generally be focused on the development of tools to facilitate the surgical techniques and hysteroscopic sterilization, there is no doubt that the advent of hysteroscopic morcellators will cause many gynecologists will use this tool in the treatment of their patients, by its ease to use.

*Unidad de Endoscopia Ginecológica, Servicio de Ginecología, Hospital Universitario de Caracas, UCV, Venezuela.
References:
