Int Urogynecol J (2015) 26:1557–1558
DOI 10.1007/s00192-015-2835-1

EDITORIAL

Open abdominal surgery: a diminishing art

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Published online: 4 September 2015

Open abdominal surgery is much more than simply opening the abdomen. It is planning what incision to use, having good vision, with adequate retraction and lighting (use of a headlight?), the art of packing the pelvis to safely remove bowel from the operative site, good suction and diathermy equipment to keep the surgical field clear of blood, and the use of appropriate surgical instruments usually specifically designed to effectively perform the desired surgical function. These instruments frequently need to be long to access deep in the pelvis. Finally, digital tactile sensation during tissue dissection, and organ palpation and manipulation are more sensitive and different from using long laparoscopic and robotic surgical instruments.

Laparotomy—the opening of the abdominal cavity—has traditionally been the preferred access to organs in the abdomen and the pelvis for benign and oncological surgical procedures, although this is changing. In a recent survey of national trends in the USA the open abdominal route was used in 65 %, vaginal in 20 %, laparoscopic 13 %, robotic 1 %, and radical hysterectomy 1 % between 1998 and 2010. The incidence of hysterectomy has been decreasing overall since 2002, with a decline in open procedures of 68 % of cases in 2002 to 54 % in 2010. Vaginal hysterectomy declined from 25 % in 1998 to 17 % in 2010 and was being performed less frequently for POP [1]. The use of laparoscopic hysterectomy increased to a peak of 15 % of cases in 2006 and then declined to 9 %; robotic hysterectomy increased from 2008 to 2010 (1–8 %).

Accessing the retropubic space through an open incision for Burch colposuspension and fascial or synthetic sling procedures for urinary stress incontinence has been replaced by small-incision mid-urethral slings. Laparoscopic sacrocolpopexy or sacrocolpohysteropexy operations is increasingly being used for pelvic organ prolapse surgery to resuspend the vaginal vault or uterus.

Therefore, in the last 10 to 20 years with developments in laparoscopy, vaginal surgery, and new innovations such as the tension-free vaginal sling (TVT) the need for open abdominal surgery has decreased significantly, which has affected surgical skills, experience, and the teaching of young surgeons. The numbers for laparotomies have reduced considerably all over the world and this will have an impact on the practice of surgery [1, 2].

The laparoscopic revolution

When laparoscopy was first introduced, it was used for visualizing the small pelvis and the abdominal cavity. Diagnosis was the main indication for laparoscopy and initially little could be done through the laparoscope. As techniques for insufflation and instrumentation improved, this changed very quickly and adnexal procedures in gynecology and cholecystectomy in surgery through the laparoscope became the norm. The benefit for the patient seems obvious—less pain and much faster recovery—but evidence of significance in prospective blinded randomized trials is surprisingly lacking. Although the term “minimally invasive” was often used to denote the laparoscopic approach for the surgeon, the operations remained challenging, with longer operation times, and major

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complications, including the death of the patient, always had to be considered.

However, today we can say that laparoscopy has become the preferred and standard approach, for many clinicians, whenever abdominal access to the peritoneal cavity is required. An example in the field of pelvic floor reconstructive surgery is the abdominal colposacropexy, which was originally conceived as an open procedure, but where laparoscopy has become the preferred approach for many clinicians [3].

The predominance of conservative measures

Another development with a major impact on surgical practice and in particular on numbers of surgical procedures performed is a shift to conservative measures. Women are much more reluctant today to let go of their uterus or adnexae. Examples are bleeding disorders, fibroids, adnexal cysts or removal of the uterus in conjunction with operations for pelvic organ prolapse. The introduction of the Mirena intrauterine contraceptive device has significantly decreased the incidence of hysterectomy in women. As a consequence, numbers for laparotomies have gone down as patients do not consent to surgery and opt for pharmacological or other treatments [2].

Implications for surgical practice and teaching

The implications for surgical practice and teaching will be significant. Fewer laparotomies mean less practical experience for the individual surgeon and fewer teaching opportunities for residents and fellows [4]. Although it is well known that surgical volume is directly related to better outcomes [5], it will be impossible to maintain the level of surgical experience needed for laparotomies in all departments and for all surgeons. And it will also be impossible to train a whole new generation of surgeons in the art of laparotomy. In some countries, France for example, there is already a clear division between training and practice in what could be called general gynecology and gynecological surgery. The realization is that actually a great deal fewer gynecological surgeons are needed.

While this is happening, it is becoming clear that the place of laparotomy will be reserved for complicated or emergency procedures. Postpartum hysterectomies and complex fistula operations come to mind. With the introduction of TVT slings, open surgery now in the retropubic space is only required to deal with complications such as bleeding or infection often secondary to infected synthetic material. These cases are often emergencies, with compromised patients who need immediate expert management. Normal anatomy is distorted by blood, infection or adhesions. Good vision with headlights and retraction, and exposure often using a Czerny incision with detachment of the rectus muscles off the pubis helps to avoid injury to bladder or ureters, and the obturator or iliac vessels. Teaching of surgery in the retropubic space during open Burch colposuspension or pubovaginal slings needs to be optimized if trainees are to become familiar with this area. Perhaps the level of competence needed to perform these procedures can only be maintained in larger departments or tertiary referral centers. In obstetrics, organizational measures must be taken to either bring in an experienced abdominal surgeon in an emergency or transport the patient to a center where laparotomies are performed routinely and safely.

The flip side of the coin is that residents and fellows can and should be trained only in procedures that are available at their place of training and that they will actually be required to do in their later professional career. It is totally unrealistic to expect every gynecological surgeon to be experienced in oncological or complex urogynecological surgery; this role will probably be taken over by a subspecialist "pelvic surgeon."

We are definitely moving toward a clearer separation between the ever smaller field of surgery and what used to be called conservative medicine. Laparotomy must not become a lost art, as open surgery will always be required in certain cases when laparoscopy is best avoided and in emergency situations, e.g., bleeding. In the future, however, open laparotomy will probably be done only by those with enough training and sufficient regular experience.

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