Perioperative pelvic hemorrhage management in prosthetic sacrospinous ligament fixation for pelvic organ prolapse

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Abstract: Acute hemorrhage following pelvic reconstructive surgery is a complication requiring immediate evaluation and treatment. Many articles describe the perioperative morbidity associated with sacrospinous ligament fixation repair of pelvic organ prolapse; few studies on management of the perioperative acute hemorrhage can be found. We report two cases of acute bleeding during prosthetic sacrospinous ligament fixation of uterus and vaginal vault, resolved with two different medical approaches. The current clinical problem of life-threatening hemorrhage during sacrospinous uterus and vaginal vault suspension is examined, and a management solution is defined.

Key words: Hemorrhage management; Pelvic floor reconstruction; Prolapse repair complication.

INTRODUCTION

Several mesh augmentation systems for pelvic reconstructive surgery have been recently introduced into the market using a variety of biomaterials with variable success rate. Initial reports from the manufacturer have included a 2.5% risk of postoperative complications, including a 1.75% of hematoma. It is plausible that inherently weak or damaged tissues in the pelvic floor need to be reinforced by a permanent support to avoid the high rates of recurrences commonly described using traditional suture techniques. The potential for life-threatening pelvic hemorrhage exists during the transobturator technique and sacrospinous ligament (SSL) fixation procedure if the ves-sels posterior to the ligament are injured including the obturator vessels (and nerves) and the venous plexus within the endopelvic fascia. Venous oozing can be controlled by pressure better than arterial bleeding. The problem is that this procedure is done blindly with finger-guide throughout each trocar’s path in a zone (around the buttock hip) in which the vascular network is very rich and any movement risky.

We report two cases of bleeding that occurred during a central-posterior mesh augmentation procedure, with SSL fixation, which were successfully managed conservatively.

Case 1

A 44-years old women with symptomatic stage 3 uterus-vaginal prolapse, using the Pelvic Organ Prolapse Quantification staging (POP-Q score). The uterus and posterior vaginal wall prolapse at its greatest extent was 3 cm beyond the hymenal ring. General conditions of patients were good, preoperative examinations excluding haematologic and coagulative alterations. A light venous insufficiency of the legs was investigated with color Doppler. Preoperative preparation were: elastic stockings and low molecular weight heparin (4000 UI sc) for thromboembolic prophylaxis within 6 hours; bowel preparation consisted in 2 preoperative enemas. Metronidazole 500 mg i.v. was administered within 1 hour from the operation. The patient signed informed consent after a thorough discussion of potential risks of this conservative prosthetic surgery, including hemorrhage requiring blood transfusions, mesh erosion, and failure of the procedure. The patient underwent loco-regional anaesthesia. A Foley catheter was introduced into the bladder.

Surgical Technique

Central-posterior repair was performed with uterine sparing technique (Figure 1). The posterior vaginal wall was infiltrated with 0.5% lidocaine and 0.25% epinephrine to assist with hydrodissection and hemostasis. A midline vertical posterior uterine incision was made, the rectum dissected with fingers and the pararectal spaces reached. Identified by blunt dissection the ischiatic spine, the SSL and the levator ani, the prosthesis was inserted and fixed to the SSL with poliester suture 1/0 using an endostitch device (Tyco Healthcare, USA). Two small skin incisions were made 3 cm posterior and lateral to the anus, and a tunneller was introduced passing through the ischiatic fossa up to the para-rectal space to bring outside the 2 slings. The uterus was suspended to the sacrospinous ligaments. The posterior colpotomy was closed with 3/0 continuous absorbable suture. Polypropylene prostheses (Gynemesh-Soft PS, 10x15cm-GyneMesh, Gynecare Ethicon) were used to reconstruct the recto-vaginal fascia, irrigated with antibiotic solution. The vagina was packed the gauze being removed on 2nd postoperative day. Intravenous antibiotics were continued for 48 hours. A significant blood loss (>500) was due to bleeding in the pararectal space that caused a 90 minutes operating time. Postoperatively a severe rectal pain was treated with ev infusion of ketorolac without relief. The hematocrit decreased from 25.2 in the first postoperative day to 20.2% in the third when a 5x7cm left pararectal hematoma was seen at transvaginal ultrasonography (Figure 2). Urine output remained satisfactory with intravenous fluid and no blood transfusion were considered necessary. The patient was discharged after 7 days with a bladder catheter, the micturition becoming spontaneous 20 days after the operation.

Case 2

A 64-year-old woman, with symptomatic POP-Q stage 4 vaginal prolapse (vault, cistocele and rectocele), and stress incontinence having had abdominal hysterectomy and bilateral aneessctomy 16 years before, in good general conditions, excluded haematologic and coagulative alterations, signed informed consent, underwent total vaginal reconstruction and fixation to sacrospinous ligament, with loco-regional anaesthesia.

Surgical Technique

A Foley catheter in the bladder.

For an antero-central and central-posterior repair, two polypropylene prostheses (Gynemesh-Soft PS, 10x15cm -
In the central-posterior repair as described in the first case (Figs 1 and 2), a significant hemorrhage occurred during the sacrospinous ligament fixation of the vaginal vault, with a 1000 ml blood loss in the right pararectal space. Postoperatively the patient was shocked with a 19.2 hematocrit value, requiring 3 blood units. A 15 x 17 cm pelvic hematoma was visualized by CT scan. Two more blood units were transfused and an angiography confirmed the bleeding from the inferior gluteal artery injured during the sacrospinous fixation. Selective embolization stopped the hemorrhage (Fig. 4-5.) and the patient was discharged after 21 days.

DISCUSSION

Any surgical innovation requires caution in the interest of patient safety and to verify that the product is more efficacious and less invasive compared with other current methods. Despite limited evidence-based medicine concerning these procedures, they are being marketed widely, sometimes to surgeons not familiar with the pertinent anatomy. A Medline search on the English literature from 1996 to 2006 using the terms extraperitoneal, colpopexy, hematoma, mesh, Prolift failed to find reports of pelvic hematomas and bleeding resulting from mesh augmentation systems.

Two cases out of 82 patients undergone this innovative procedure are reported with a severe pelvic hemorrhage during and after a prosthetic sacrospinous ligament fixation. In case of significant blood loss (> 500 ml) it is important to identify bleeding sites, arterial (obturator vessels, obturator-dorsal artery of clitoris, deep branches of internal pudendal, inferior haemorrhoidal artery) or venous (lateral attachment of pubocervical fascia, entering pararectal space, sacrospinous placement). The procedure is done blindly with finger-guidance throughout each trocar passage in an area very rich of vascular network. The inferior gluteal artery is the vessel most likely to be injured during sacrospinous fixation, because of its location. It commonly has six branches, two of which with important anastomoses around the sacrospinous ligament (main branch and coccygeal branch). In 25% of the women it arises from the posterior instead of the anterior branch of the internal iliac artery: in these cases the binding of the hypogastric artery to control of pelvic hemorrhage is useless as the posterior branch of the internal iliac artery is not involved.

When the pudendal artery is damaged, the haemorrhage can be treated by surgical ligation of the hypogastric artery, because the pudendal vessels are rarely associated with a pelvic hematoma. The anterior vaginal incision was closed with a 3/0 continuous absorbable suture.
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Collateral circulation. In all other circumstances the resulting haemorrhages are particularly difficult to control due to anastomoses between the hypogastric, vertebral and circumflex femoral arteries. In these cases, prolonged compressions with dressing gauzes and direct clipping of injured vessels is the first-choice treatment, while arterial embolization is an alternative treatment. In some cases surgical packing and clippings are not sufficient to stop the bleeding and different operations can be necessary. Management of important bleeding during pelvic surgery are: anticipating the entity of bleeding with blood transfusion preparation and support, minimise operating time and tissue trauma. If general conditions are restored with fluid replacement and blood transfusion, it means that bleeding sites are certainly venous, otherwise it is extremely important early intervention with angiography, as described in our two cases.13

REFERENCES

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