Synthetic materials for managing POP and urinary incontinence

Rare complications

We live in an era in which synthetic materials are used extensively in medicine. Pelvic organ prolapse (POP) repair and the treatment of stress urinary incontinence using traditional surgical techniques is associated with a high rate of recurrence. Currently, synthetic tapes and meshes are frequently used in these types of surgery with very good clinical outcomes. At the same time, there has been an increase in the number of mesh-associated complications. Although rare, these complications can have serious consequences. During the past several years, many reports of complications associated with synthetic meshes have been published in the literature. The most frequent complications include vaginal erosion, mesh shrinkage, infections, pain, urinary tract disorders and a recurrence of prolapse. There have also been reports of rare complications, such as bowel, bladder, and blood vessel perforation during insertion.

In 2011, the joint committee of the ICS-IUGA published a standardised terminology and classification for complications related to synthetic and biological materials in female pelvic floor surgery. This classification is designed to comprehensively cover complications in both insertion and healing. The POP-Q has been used widely around the world for the classification of prolapse and serves as a good example; we hope that this new classification of prolapse complications will achieve similar prominent usage.

Complication is a morbid process or event that occurs during the course of a surgery (or postoperatively) that is not an essential part of that surgery. -Stedman’s Medical Dictionary

At the same time, there are rare, unique complications that can occur due to the coincidence of multiple uncommon factors. The purpose of this paper is to highlight some of these rare cases and to warn readers of potential problems such as those described here.

Ureteral obstruction

A 27-year-old multiply nulliparous woman was referred by her gynaecologist because of increasing urinary incontinence upon walking and exercising and complaints of urinary dribbling or wetness. Uroflowmetry revealed a maximum flow rate of 19 ml per second, and cystometry revealed a stable detrusor. The patient chose to have surgical treatment because she was not benefiting from physiotherapy. She was advised about the possibility of delivery in delay after sling surgery.

In 2009, a transobturator tension-free tape procedure was performed uneventfully. On the first postoperative day, the patient developed right flank pain with no decrease in urine output. Examination revealed tenderness over the right renal angle. Ultrasound examination showed right-sided hydronephrosis. Intravenous urography confirmed right-sided hydronephrosis. Intravenous urography confirmed right-sided hydronephrosis. Intravenous urography confirmed right-sided hydronephrosis. Intravenous urography confirmed right-sided hydronephrosis. Intravenous urography confirmed right-sided hydronephrosis. Intravenous urography confirmed right-sided hydronephrosis. Intravenous urography confirmed right-sided hydronephrosis. Intravenous urography confirmed right-sided hydronephrosis. Intravenous urography confirmed right-sided hydronephrosis. Intravenous urography confirmed right-sided hydronephrosis. Intravenous urography confirmed right-sided hydronephrosis. Intravenous urography confirmed right-sided hydronephrosis. Intravenous urography confirmed right-sided hydronephrosis. Intravenous urography confirmed right-sided hydronephrosis. Intravenous urography confirmed right-sided hydronephrosis. Intravenous urography confirmed right-sided hydronephrosis. Intravenous urography confirmed right-sided hydronephrosis. Intravenous urography confirmed right-sided hydronephrosis. Intravenous urography confirmed right-sided hydronephrosis. Intravenous urography confirmed right-sided hydronephrosis. Intravenous urography confirmed right-sided hydronephrosis. Intravenous urography confirmed right-sided hydronephrosis. Intravenous urography confirmed right-sided hydronephrosis. Intravenous urography confirmed right-sided hydronephrosis. Intravenous urography confirmed right-sided hydronephrosis. Intravenous urography confirmed right-sided hydronephrosis. Intravenous urography confirmed right-sided hydronephrosis. Intravenous urography confirmed right-sided hydronephrosis. Intravenous urography confirmed right-sided hydronephrosis.

Surgical exploration confirmed complete ureteral obstruction at the level of the tension-free vaginal tape (Figure 1). The patient underwent nephroureterectomy with full symptomatic resolution.

Urinary incontinence in young women who have been toileted may be due to ectopic ureteral insertion below the urethral sphincter. This diagnosis is frequent during the second and third decades of life, and it is medically, psychologically, and socially distressing, and it may be missed at physical examination. According to the current literature, renal duplication with associated complete ureteral duplication can cause continuous incontinence in young women if the ureter draining the upper pole moiety inserts ectopically below the external sphincter1. Ideally, the diagnosis of this condition should be made in early childhood.

In this case, an unrecognised ectopic duplication of the urinary tract mimicked stress urinary incontinence, which led to the insertion of tension-free vaginal tape via a transobturator approach; the synthetic tape then caused an obstruction of the ureteral orifice. This case demonstrates that a thorough and attentive approach is mandatory in order to identify the congenital abnormalities prior to surgery.

Ureteral trauma

A 70-year-old woman with stage III cystocele was admitted to our urogynaecological clinic for pelvic organ prolapse (POP) mesh surgery. Anterior transvaginal mesh implantation of a four-armed anterior implant inserted using four trocars passed through the obturator foramen were performed. At the second day post-surgery, the patient noted moderate edema and pain in her right hip. Her temperature was 37.2 ºC, and the blood tests revealed normal white and red blood cell counts. A contrast CT scan showed urinary leakage on the right side (Figure 2A) and 4 mm interfacial space of the right hip (Figure 3B).

The patient was taken to the operating room. A retroperitoneal approach revealed complete injury of the right ureter at the level of the right posterior arm of the mesh. Ureterocystotomy with Boari flap was performed. Blood loss was minimal, and the operation lasted 75 minutes.

Anatomical landmarks are essential in pelvic organ prolapse repair. During hands-on training for mesh surgeries, it is necessary to pay special attention to these landmarks and anatomical topography. The ureters are always in close proximity to the cervix, and ureteral injury should be considered as a potential risk in patients with extensive prolapse.

After one month, the patient presented with prolapsed loops of small bowel protruding through the vagina. The event occurred three hours prior to admission. On examination, she was afebrile with stable vital signs, and her abdomen was soft and non-tender. Urinary incontinence, which was present before surgery, had disappeared. Exploration revealed several loops of small bowel protruding from the vagina (Figure 6). The serosal surface appeared pink with visible peristalsis.

Small bowel evagination after POP surgery

A 56-year-old multiparous female was referred to the center in May of 2008 with the chief complaint of pelvic pain and bladder emptying problems. She had undergone vaginal hysterectomy and the simultaneous insertion of trocar-guided mesh for pelvic organ prolapse (POP) six months prior to referral. Physical examination revealed that the dyspareunia and emptying abnormalities were caused by significant shrinkage of the mesh. She opted for surgical repair and asked that proper sexual function be preserved.

After consultation with a pain specialist, a decision was made to proceed with the excision of the vaginal mesh. The folded and shrunken mesh was successfully removed, and the patient was discharged within several days (Figure 5).

Discussion

Modern surgical techniques for the management of stress urinary incontinence and pelvic organ prolapse are presumed to be a minimally invasive with almost no complications. At the same time, it should be emphasized that the implantation of surgical mesh is permanent, that some complications associated with the implanted mesh may require additional surgery, and that even surgery may not correct the complication. There are some obvious measures that can help reduce the rate of complications. First, each surgeon must obtain specialised training for every mesh placement technique to ensure that he or she is aware of its specific risks. This seems to be particularly important because all synthetic surgical kits are based on different techniques. Specific risk factors for complications associated with mesh positioning have not been properly determined. Contributing factors may include the overall health of the patient, the mesh material, the size and shape of the mesh pores, the surgical technique itself, the occurrence of simultaneous procedures, such as hysterectomy, and other factors.

Special attention should be paid to complications associated with the trocars for transvaginal placement, especially in the bowel, bladder and blood vessels. However, these cases are due to these issues cannot prevent all complications.

The European Association of Urology is providing an annual master class on Female and Functional Reconstructive Urology in Berlin to provide a high level training program for European specialists. Specialised long-term training for specialists in centres of excellence is an essential and urgent need in EAU postgraduate programs.

References


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Figure 1: Right-sided hydronephrosis associated with a dysplastic kidney and an enlarged right ureter draining ectopically into the vagina (courtesy of Prof. O. Loran)

Figure 2: Urinary stress incontinence into the vagina (courtesy of Prof. G. Lorenz)

Figure 3: CT scan showing urinary leakage on the right side (A). Urine leakage extending to the interfascial spaces of the right hip (B)

Figure 4: The right ureter is in close proximity to trocars for transvaginal placement (A). Urine leakage extending to the interfascial space of the right hip (B).

Figure 5: The mesh on the anterior vaginal wall is completely shrunken (A). The removal of the mesh (B).

Figure 6: Evisceration of small bowel through the vagina

Figure 7: Three months after the surgery (A). The same patient after sacrocolpopexy (B).