A Case Report of an Unusual Bladder Outlet Obstruction After Midurethral Sling Placement and Review of the Literature

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ABSTRACT

Background: Tension-free mid-urethral sling procedures are next to bulking agents, fascial slings and colposuspension a possible treatment in stress urinary incontinence with high success rates up to 90%. This is an unusual and unique case of delayed presentation of a tension-free vaginal tape (TVT) complication involving the pubic bone. It shows an unusual possible cause of bladder outlet obstruction by a reactive inflammatory myofibroblastic pseudotumor. We discuss the diagnosis and management of this unique case of bladder outlet obstruction.

Case presentation: We present an exclusive case of a 66-year woman with a rare cause of bladder outlet obstruction (BOO) after midurethral sling placement for recurrent stress urinary incontinence. Nine years after successful midurethral sling (MUS) insertion with relief of incontinence symptoms, the patient complained of spraying stream and prolonged micturition. Bladder outlet obstruction caused by a large retropubic myofibroblastic pseudotumor was detected by clinical examination and MRI. After removal of the mass and part of the pubic bone a plate osteosynthesis was performed. The patient received physiotherapy and local estrogen therapy. Patients' symptoms improved reporting non-bothering intermittent incontinence episodes. The patient showed up recently and received again physiotherapy.

Conclusions: Although bladder outlet obstruction after midurethral sling placement is mainly caused by an overtightened sling other factors should be considered.

Keywords
Bladder outlet obstruction; tension-free vaginal tape; long-term complications; pubic bone mass

BACKGROUND

Stress urinary incontinence (SUI) is defined as involuntary leakage of urine on effort, physical exertion, sneezing or coughing [1]. Dependent on several risk factors it affects 5-70% of women[2]. The estimated lifetime risk of a woman undergoing surgery for SUI is 13.6% [3].
Since its first introduction and standardization in 1996 by Ulmsten et al. [4], midurethral slings have largely been regarded as the gold standard in the treatment of SUI [5]. Complications are rare and only 3.7% of patients experience perioperative complications [6, 7]. Next to bladder injury, other complications like injury of the urethra, vessels or bowel are largely reported. Foreign body reactions and benign tumors related to polypropylene mesh are known.

A similar case report with an inflammatory myofibroblastic tumor of the urinary tract following tension free vaginal tape was found in a patient. Ten weeks after TVT insertion the patient suffered of gross hematuria and urgency/frequency symptoms, caused by a large area of denuded bladder mucosa without evidence of mesh erosion. A partial cystectomy with resection of the pelvic mass and complete excision of polypropylene mesh was performed by abdominal and vaginal approaches [8].

Azadi et al. reported in a case report a tumor-like reaction to polypropylene mesh from a midurethral sling material resembling giant cell tumor of the vagina. The patient bothered dyspareunia and urgency/frequency symptoms. They were relieved after MUS excision [9] Foreign body reactions by increased macrophage and mast cell count are frequent after reconstructive surgery in macroporous monofilament polypropylene mesh insertion [10] despite their tissue friendly properties[11]. Nevertheless, few studies demonstrated large reactions leading to pain or mass feeling.

CASE REPORT

A 66-year-old Caucasian housewife presented to our outpatients clinic with a short history of sensation of mass in the pelvic floor, voiding dysfunction with spraying stream and pain while sitting and cycling.

The patient with a BMI of 29.5 kg/m2 had had three spontaneous deliveries in the past. Her relevant surgical history include several incontinence procedures. First, she underwent a Burch colposuspension by laparotomy at the age of 35 followed by a total abdominal hysterectomy with a Marshall-Marchetti urethropexy at the age of 43. At the age of 44 an anterior colporrhaphy was performed. By 2001 at age of 57, still suffering from a mixed urinary incontinence with predominant SUI, a retropubic TVT was set in a small district hospital. No information about the material of the alloplastic sling was known. No postoperative complications occurred. Stress urinary incontinence was cured (without implications on urgency symptoms).

Eight years after insertion of a MUS the patient presented to our clinic. Abdominal examination showed no specific findings, while vaginal examination revealed a 4cm large painful and displaceable paraurethral mass surrounding the distal part of the urethra.

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Urodynamic multichannel testing was performed. Uroflowmetry showed a pathologic interrupted flow pattern suggesting obstruction (maximum flow rate 4-5 ml/s, voided volume 33ml, residual 400ml) (Figure 1).

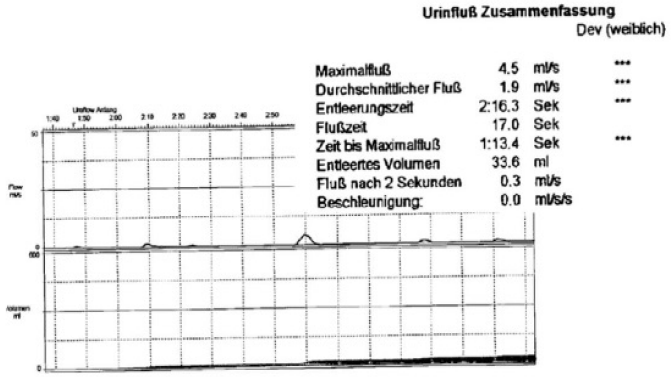


Figure 1: Uroflowmetry with an obstructive flow rate

Perineal ultrasound could not delimit a tumor in the periurethral tissue and MRI of the pelvis was performed see figure 2. It detected a cystic retropubic mass close to the pubic bone with compression of the urethra and bladder neck anteriorly suspicious of malignancy, infection or foreign body reaction.

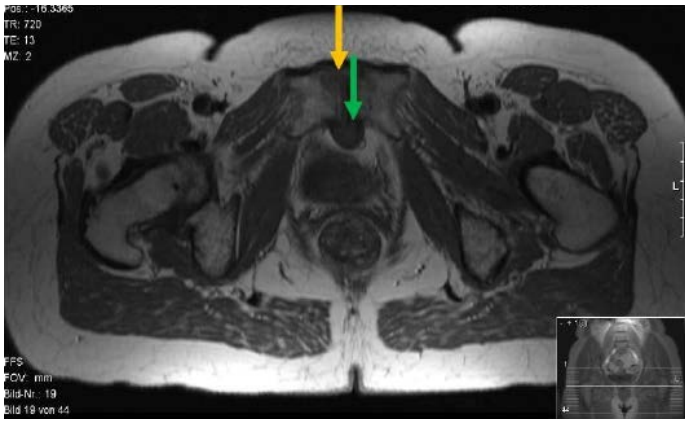


Figure 2: UMRI of the pelvis demonstrating the palpable retropubic cystic mass compression of the urethra

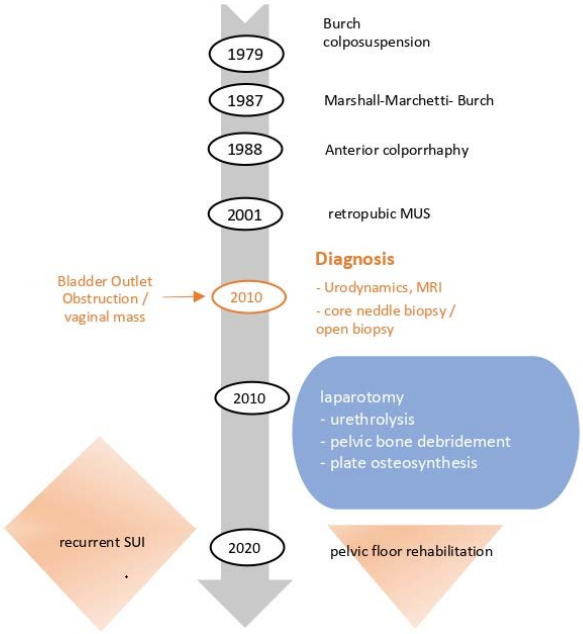
A core needle biopsy was performed to rule out malignancy. Clear liquid was discharged from a cystic mass. Cytology revealed myxoid cells but did not show a malignancy.

Following a multidisciplinary urogynaecologic and orthopedic review, we suspected symphysitis and open biopsy was performed. In histology no malignancy, while scar tissue, fibrosis and myxoid tissue was found. Infection could be excluded missing bacterial growth in the swab taken from the pubic bone.

Consequently, she underwent a second laparotomy with urethrolysis, mesh material removal as well as debridement of the pubic bone with plate osteosynthesis for stabilization. Histopathological results showed inflammatory changes (see figure 3). Immunohistochemistry was not possible. No malignancy was found assuming an inflammatory myofibroblastic reaction leading to a pseudotumor.

On postoperative follow up, the patient was asymptomatic, no urinary incontinence apart from spraying stream. Vaginal examination without revealing a mass but the plate osteosynthesis. Urethral mobility was given, and the voiding function restored. Postvoid residual volume was 20 ml.

In 2020, the patient was again referred for recurrent stress urinary incontinence, which resolved after pelvic floor rehabilitation. No



further action was required so far.

Figure 3: Summary of patient history

LITERATURE REVIEW

We performed a literature review in PubMed publications in English with the search criteria “midurethral complication”, “suburethral sling complication”, “bone complication”, “TVT complication” “foreign body reaction, sling/TVT”.

We found a total number of 2495 publications in English, German and French. Excluded were articles in German and French (n=334), men (n=227), animal and in vitro studies (n=139). Meta analysis and Reviews (n=1731) were excluded. Not related complications (n=21) and papers rated irrelevant (n=34) were excluded. From the eleven remaining articles, eight were added by hand searching See figure 4.

Subjective selection criteria:

Sixty-four articles remained for final analysis. Eleven of these publications were regarded as currently relevant and served as the basis for this article. We found six cases of bone complications. Histology revealed benign histology (myofibroblastic pseudotumor, osteochondroma, giant cell tumor). Treatment included complete resection of the tumor and the MUS with relieving patients’ symptoms postoperatively.

The case report was written in accordance with the CARE guideline [12].

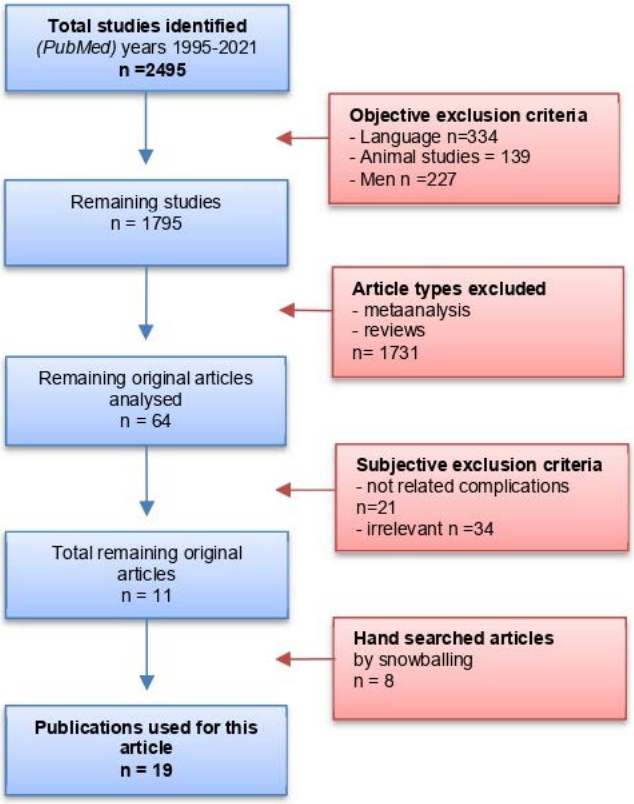


Figure 4: Literature review

DISCUSSION

Treatment of SUI by minimally invasive procedure such as MUS has low rate of readmission, reoperation and complication. Consistent with other surgeries urinary tract infection is the most common post-operative complication[13].

The incidence of BOO in MUS is 4,1% after 3 years, 7% after 5 years and therefore is a common long-term complication[13]. The most common reported cause leading to dysfunctional voiding by this procedure is the abnormal positioning of the sling near the bladder neck or an excessive tension to the sling during the procedure. Like in our patient, obesity can influence MUS location[14] and reduce efficacy of the procedure [15]. But obesity does not influence the rate of postoperative urinary retention compared to non-obese patients, whereas previous surgery for incontinence is an independent risk factor for BOO[16, 17].

Even though malposition, overcorrection or sling under excess tension are the most common reasons for BOO [13], foreign body reactions or tumors emerging around the sling could induce the same symptoms. Scarce data is available about "tumor" formation after MUS placement, but osteochondroma, tumor-like reaction of the tissue and increased inflammatory response can be cause of a space-consuming mass.

Osteochondroma are benign neoplasms of the bone and account for 10-15% of all bone tumors with an incidence of 3% [18]. A rare case of osteochondroma arising from the pubic symphysis involved with aberrantly placed minisling was reported by Lee et al [19]. It is known that osteochondroma can arise indifferent of previous surgery and trauma, causing bladder outlet obstruction [20].

Additional concerns have been raised about the synthetic midurethral slings and the possible link with malignancy. As it showed high rate of sarcoma formation in animal studies, but so far in the literature, no malignancy associated with polypropylene mesh has been reported in humans [21 22]. Recent studies revealed the clinical safety of nowadays-used thin, macroporous polypropylene meshes. Their carcinogenic properties are negligible, compared with solid implants used in animal studies [23]. The international Agency for Research on Cancer determined in the year 2000 that there was no evidence for carcinogenesis with the human use of synthetic implants [24]. Vigil HR et al. supported this thesis in their retrospective cohort study, as they did not find any association of mesh with malignancy as a permanent implantation[25]. A population-based cohort study examined a possible long-term association involving midurethral polypropylene sling surgery for SUI and cancer risk. It showed no significant association in either adjacent pelvic organs or any other specific organ system [26].

CONCLUSION

Although BOO is usually caused by an overtightened sling, a space-consuming mass should be sought even if the tumor process is initially clinically and radiologically inconclusive.

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Potential Conflicts of Interest: None

Competing Interest: None

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