**Original article**

# Complications of tension-free tapes and support grafts

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*Abstract*: Tension free vaginal tape (TVT) has become the treatment of choice for females with stress incontinence (SUI), since the first description from Ulmsten and Petros, in 1995. Success rate for TVT, as long as for the later described supporting the mid-urethra transobturator tapes, have been found high. Complications frequency is low for all types of tapes, but complications do still appear. The necessity for decreased complications led to the development of new supporting tapes such as TVT-secur and Needleless. Success rates concerning continence and quality of life have been evaluated and published, but complications rates and their treatment options still remain controversial. Purpose: To present the complications following application of mid- urethra supporting tapes and pelvic floor grafts, in order to treat SUI and pelvic floor prolapse respectively.

*Key words*: TVT; Stress urinary incontinence; Complications.

## INTRODUCTION

According to the International Continence Society (ICS), SUI is defined as the involuntary urine leakage during physical effort, sneezing, coughing and exercise. MUI (Mixed urinary incontinence) is defined as the involuntary urine leakage due to urgency (a sudden, strong desire for urination which cannot be inhibited) and concomitant stress incontinence.

The prevalence of incontinence ranges from 2 % to 55 % depending on the definition, the type, the data, the sex and the various population groups. The prevalence in young women varies from 10 % to 40 % but in older women and elderly centers[1] it might be found more than 50%.

Incontinence has an important impact in the quality of life (QoL) which often is not properly evaluated by physicians and other health - related professions. Surgical complications following SUI correction might affect QoL more than preoperatively.

TABLE 1. – Complications after MUS application according to the international literature..

| **OPERATIVE COMPLICATIONS** | **Frequency(%)** |
|---|---|
| **Major** | |
| Vascular injury | < 0,01 |
| Nerve injury | < 0,0005 |
| Bowel injury | < 0,007 |
| **Minor** | |
| Bladder perforation | 0,5 - 14 |
| | |
| **PERIOPERATIVE COMPLICATIONS** | |
| Retropubic hematoma | 2 - 4,3 |
| Blood loss > 200 ml | 2,7 |
| Urinary infection | 10 |
| Spondylitis | 0,3 - 0,8 |
| | |
| **POSTOPERATIVE COMPLICATIONS** | |
| Temporally voiding dysfunction - Retention | 1,4 - 15 |
| Permanent voiding dysfunction – Retention | 2,4 - 8 |
| Erosion of the vagina | 0,7 - 33 |
| Erosion of the urethra | 2.7 - 33 |
| Erosion of the bladder | 0.5 - 0.6 |
| De novo urgency | 7,2 - 33 |
| Urethral obstruction | 3,6 - 6,4 |

Many techniques, materials and surgical procedures have been described for the correction of the female urinary stress incontinence (SUI), since the first presentation of the mid – urethral slings (MUS).[2]

Although the security, the effectiveness and the complications concerning TVT and transobturator procedures (TOT)[3] have been adequate estimated, this is not a fact when it comes to the treatment of these complications.[4]

The most recently presented tapes (TVT- secur, needleless) have been introduced to the surgical treatment of SUI in order to reduce the frequency and the severity of those complications.[5-6] Surgical treatment of pelvic organ prolapse and SUI is considered to be successful when QoL is improved. It is also considered to be successful in cases where despite the failure of the correction and even the occurrence of certain complications, there isn't any severe impact on patients QoL.[7]

## COMPLICATIONS

The use of MUS became a popular way of SUI treatment because of the high success rate. The frequency and the variability of those complications is depended on various factors such as a) surgeon's experience, b) correct diagnosis and report, c) deliberately decreased complication's rates by surgeons who have higher rates, d) reduction of complication's frequency and severity rates, in some clinical trials, due to underestimation. Also, other important factors are the time of diagnosis and the clinical symptoms and evidences.

In table 2 are presented the complication's symptoms.

Urologists and gynecologists must be aware that most of complications appear early after surgery.[8] They also must be able to identify the clinical symptoms in order to resolve the problem as soon as possible. The effectiveness of the new surgical techniques improves with the experience that is gained with time. In our technological era the learning curve is quite prolonged, but it seems that the difficulty of learning is not related with the complications. These complications have to do more with the surgical procedure than with the experience of the surgeon.

Complication rates increase due to co-existing diseases such as diabetes, vascular diseases, obesity, or prior pelvic irradiation applied for gynecological cancer.

TABLE 2. – Complication's symptoms.

| COMPLICATIONS | Symptoms |
|---|---|
| **Obstruction** | Post void residual urine - incomplete empting |
| | **Voiding dysfunction** |
| | **Relapse urinary infections** |
| | **Urgency** |
| | **Reduced urinary flow** |
| **Bladder erosion** | Hematuria |
| | **Suprapubic or urethral pain** |
| | **Urinary infection** |
| **Vaginal erosion** | Vaginal Pain |
| | Dysparuneia |
| | Voiding dysfunction |
| | Urinary infection |
| | Vaginal discomfort |
| **De novo urgency** | Frequency |
| | Urgency |
| | Nocturia |
| | Urgency incontinence |
| **Urethral erosion** | Pain |
| | Urethral bleeding |
| | Urethral discomfort |
| | Urethretis |
| | Urgency |

TABLE 3. – Etiology of complications.

| COMPLICATIONS | Etiology |
|---|---|
| **Vaginal erosion** | Incomplete closure of the vaginal wall |
| | Extensive surgical dissection of the vaginal wall |
| | Early sexual intercourse |
| | Previous vaginal operations |
| | Trauma inflammation |
| | Wrong surgical incision |
| | Torsion of the sling |
| | Ischemia |
| **Urethral erosion** | Increased tape tension |
| | Ischemia |
| | Extensive dissection |
| | Previous operations |
| | Inflammations |
| | Inappropriate surgical field |
| | Torsion of the sling |
| **Perforation of vagina** | Surgical technique |

## COMPLICATIONS TREATMENT

**Superficial hematomas** were treated conservatively.[9] They were caused due to false positioning of the patient on the surgical bed (Figure 1).

The first case of **retropubic hematoma** was observed immediately after TVT application. Surgical exploration and blood transfusion was needed. No major vassal injury was found. The second case of retropubic hematoma was treated conservatively. Only blood transfusion was needed. The case of retropubic hematoma, due to mesh application (cystocele Gr II), was treated at first conservatively. Next day's examination indicated severe bilateral hydronephrosis. Percutaneus nephrostomies were placed. The urine flow in the left ureter was restored after a period of two months, whether the right ureteral orifice had to be transurethricaly resected in order to maintain the urine flow (Figure 2).

If the bladder perforation is promptly diagnosed during the tape application, then the tape must be repositioned. Special care and experience is required during cystoscopy in order to detect bladder perforation or even more a submucosal displacement of the tape, which later on can lead to bladder erosion.

Two cases with **bladder perforation** complained for LUTS six months after the tape application. According to the international literature an open surgical removal of the calcified tape is suggested. In our cases transurethral resection and partial removal of the tape was successfully performed. All symptoms were immediately withdrawn. One patient remains continent and another underwent T.O.T. replacement after two months (Figures 3, 4, 5).

Vaginal erosion was diagnosed in four patients. It was caused by early sexual intercourse, wound infection, and inappropriate vaginal incision closure. In one patient the in-

TABLE 4. – Complications of supporting grafts, according to international literature.

| COMPLICATIONS |
|---|
| **Vaginal erosion** |
| **Urethral erosion** |
| **Urinary infection** |
| **Relapse of the prolapse** |
| **Hematoma** |
| **Bladder perforation** |
| **Bowel trauma** |
| **Dyspareunia** |
| **Constipation difficulties** |
| **Urgency** |
| **Voiding dysfunction** |
| **SUI** |
| **Pain during walking** |

TABLE 5. – Complications of vaginal tapes and support grafts which were diagnosed and treated by the Urological Clinic of Ippokratio General hospital of Thessaloniki until November 2007. (Including cases which were sent to Ippokratio from other Medical Centers).

| COMPLICATIONS | TVT =265 | TVT-O TOT = 112 | P | TVT-S NEEDLESS =19 | MESH =19h |
|---|---|---|---|---|---|
| **Retropubic Hematoma** | 2 | - | NS | - | 1 |
| **Bladder perforation** | 26 | - | 0,02 | - | - |
| **Vaginal erosion** | 4 | 1 | NS | - | - |
| **Bladder erosion** | 2 | - | NS | - | - |
| **Retention** | 3 | - | 0,45 | - | |
| **Voiding dysfunction** | 27 | 4 | 0,02 | - | - |
| **Pain** | 38 | 14 | 0,02 | - | 2 |
| **Urinary infection** | 53 | 4 | | 1 | 1 |
| **De novo urgency** | 37 | 4 | NS | 2 | 2 |
| **Dyspareunia** | - | - | | | 2 |

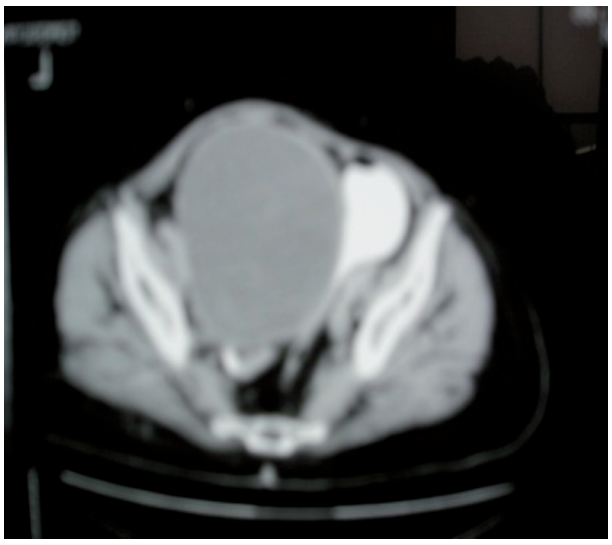

Figure 1. - Retropubic hematoma.

Figure 2. - Percutaneus nephrostomies.

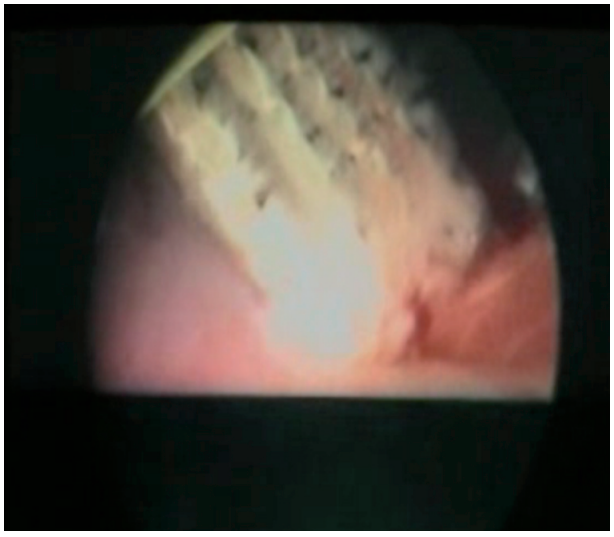

Figure 3. - Intravesical tape migration.

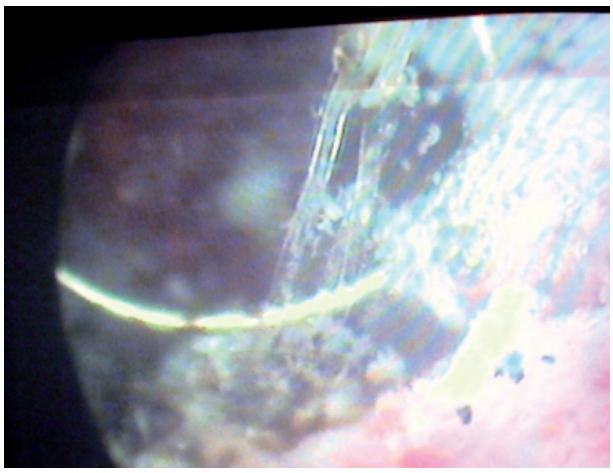

Figure 4. - Transurethral tape removal.

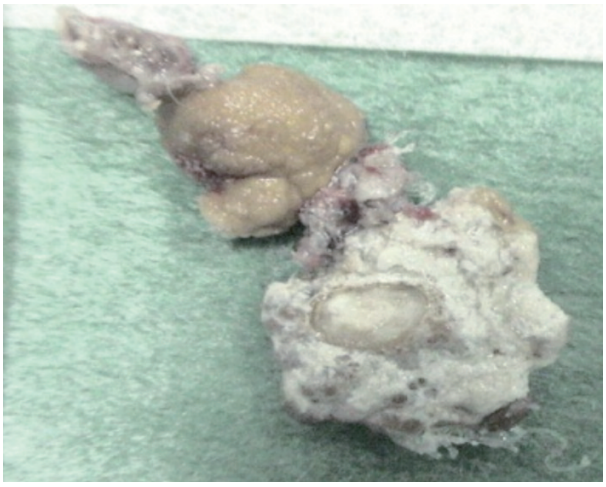

Figure 5. - Removed calcified tape.

Figure 6. - Tape dissection.

fection was treated by antibiotics and hormonal therapy ( oestrogens), which contribute in the healing of the vaginal wall. Three other cases underwent partial dissection of the tape and reconstruction of the vaginal incision margins. (Figure 6)

One patient with voiding dysfunction (dysuria) was treated conservatively.[10] In three other cases with urinary retention the tape had to be removed surgically because of the initial therapy failure to respond in urethral dilatations and intermitted catheterizations. Pain was treated with antiflamatories and analgetics, urinary infections with antibiotics, and de novo urgency with antimuscarinics. Dysparuneia was treated with locally application of oestrogens in the vagina.

## CONCLUSION

Treatment of female urinary stress incontinence and pelvic organ prolapse with tension free tapes and mesh respectively are safe and effective procedures. Perioperative and postoperative complications, when promptly recognized can be easily treated. A prolonged follow up is required in order to treat or avoid late complications.

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