

Transobturator vaginal tape inside-out A minimally invasive treatment of stress urinary incontinence: Surgical procedure and anatomical conditions

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Abstract

Objective: The aim of this study was to review the surgical transobturator vaginal tape inside-out (Gynecare TVT-O, Ethicon Inc., Somerville, NJ) technique as described by de Leval and to present the relevant anatomical conditions of the lower pelvis on the basis of corpse dissections after TVT-O placement.

Study design: In order to visualize the anatomical structures through which the tape runs, anatomical dissections of five corpses after TVT-O placement were performed. Furthermore, the dissections made possible to give a detailed description of the neighbouring neurovascular structures.

Results: The anatomical dissections show that the transobturator tape does not reach into the retropubic space at any time during the procedure, so that injuries of the bladder, of the epigastric vein and the external iliac vessels are not to be expected. The distance between the tape and the major neighbouring neurovascular structures shows slight individual differences, however without the danger of neurovascular injuries if the surgical procedure is performed as recommended.

Conclusion: Precise knowledge about the anatomy of the area of operation provides the surgeon with the possibility to safely conduct the operation and it contributes to a reduction of perioperative complications.

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1. Introduction

Stress urinary incontinence is a devastating condition that afflicts 20% of the women. Although many therapeutic options are available for the treatment of stress urinary incontinence, the surgical treatment remains the most effective [1].

The tension-free vaginal tape operation (TVT) as described by Ulmsten and Petros [2] has become one of the most popular surgical procedures for the treatment of stress urinary incontinence. Several reports have confirmed a high curing rate [3–6].

The frequent use of retro-pubic tension free suburethral slings has been associated with various peri- and post-operative complications [5–12]. To reduce these complications, particularly with high-risk patients like those who have been operated on before in the lower pelvis, an alternative approach with a transobturator passage of the tape has been developed [13,14].

The aim of this article is to review the surgical transobturator vaginal tape inside-out (Gynecare TVT-O,

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Ethicon Inc., Somerville, NJ) technique as described by de Leval in 2003 [13] and to present the anatomical conditions of a part of the lower pelvis on the basis of corpse dissections after TVT-O placement.

2. Material and methods

At the University of Tuebingen, the TVT-O operation generally is performed under local anaesthesia, unless the patient undergoes surgical treatment of stress urinary incontinence in combination with a surgical treatment of genital prolaps at the same time. The surgical technique is the same as described by de Leval in 2003 [13].

In order to visualize the anatomical structures through which the tape runs, anatomical dissections of five corpses after TVT-O placement were performed.

The surgical procedure of the implantation of the TVT-O in the corpses was identical with operations performed on patients with stress urinary incontinence following de Leval's technique.

Bodies donated for research and medical education to the Institute of Anatomy Tuebingen were used. For the study the corpses were preserved with alcohol–glycerol. The arteries were filled with collared silicone for better visibility. This preservation technique maintains tissue properties and the legs can be positioned in hyperflexion. The injection solution consists of five parts ethanol and two parts glycerol. Twenty-one to 30 l of embalming solution were injected into the femoral artery, depending on the size of the corpse. Fifty milliliters of lysoformin were added to the injection solution as disinfecting agent. The corpses are kept airtight under refrigerated conditions (8 °C).

3. Results

3.1. Surgical procedure

The patient is placed in the gynaecological position with thighs in hyperflexion. After the usual preparation of the patient a urethral catheter is inserted into the bladder, which is emptied. Then the local anaesthesia is performed.

The anterior vaginal wall is incised at a length of 1 cm and at a distance of 1 cm proximally to the urethral meatus. This step is followed by introducing fine dissection scissors through the initial dissection path towards the upper part of the ischio-pubic ramus on a horizontal plane with a 45° angle to the urethral sagittal plane as indicated in Fig. 1. Once the upper part of the ischio-pubic ramus is reached, the obturator membrane is perforated with the tip of the scissors. An introducer, with the open side of its gutter facing the surgeon, is pushed along the preformed dissection canal until it reaches and perforates the obturator membrane. The distal end of the tube mounted onto the spiral segment of the needle (Fig. 2) is gently slipped along the gutter of the

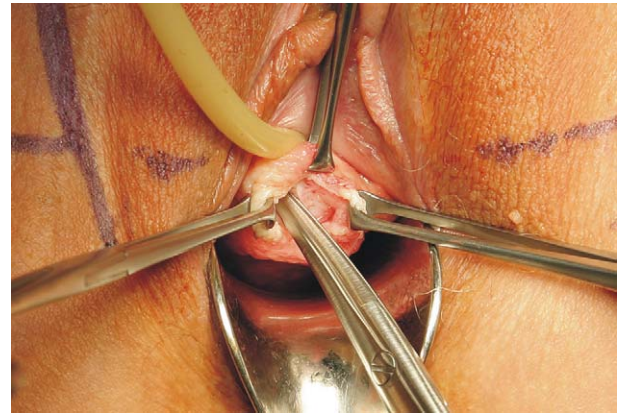


Fig. 1. Median sagittal incision of the vaginal wall. Introduction of fine dissection scissors towards the upper part of the ischio-pubic ramus to perforate the obturator membrane.

introducer in order to pass through the obturator foramen (Fig. 3). Then the introducer is removed. After the tube has appeared at the previously determined skin exit point (Fig. 4a), the tube is pulled off from the supporting needle, which is removed. The same technique is applied at the other side.

Next the ends of the tape are cut, the tape is aligned under the middle of the urethra, creating space and avoiding any tension of the tape by grasping the tape at its middle with a blunt clamp (e.g. Babcock clamp), thus creating a small loop of 5 mm. The plastic sheaths are then removed simultaneously. The tape ends are cut in the subcutaneous layer and the incisions are closed.

Postoperative indwelling catheterisation is not required. The patient should be encouraged to try to empty the bladder 2–3 h after the operation.

3.2. Anatomical conditions

After the transobturator placement of the tension-free vaginal tape in the above-described manner, we performed the corpse dissections. Because of the preservation of the



Fig. 2. Gynecare TVT-O special device.

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