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Anatomical Risks of Transobturator Suburethral Tape in The Treatment of Female Stress Urinary Incontinence

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Abstract

Introduction: The objective of this study was to define the anatomical structures crossed by transobturator tape.
Materials: Ten fresh, female anatomical subjects aged 74 to 89 years.
Methods: Transobturator tape was inserted by outside-in way. The position of the tape was verified by perineal and abdominal dissection.
Results: Transobturator tape has a transverse course. It crosses the adductor muscles close to their pubic insertion and passes over the inferior border of the obturator foramen by crossing the obturator membrane, before reaching the middle plane of the perineum after having crossed the obturator internus muscle.

The tape passes above the internal pudendal pedicle and then under the levator ani muscle, under the tendinous arch of the pelvic fascia and continues in the middle third of the urethrovaginal septum. It avoids femoral and obturator vessels in the thigh and pudendal vessels in the perineum.
Conclusion: The anatomical course of transobturator tape shows that the anatomical structures crossed by the tape are muscle and fascia and, when the technique is performed correctly, no major neurovascular structures are in contact with the tape.

Keywords: Incontinence; Surgery; Transobturator; Anatomy

1. Introduction

Tension-free Vaginal Tape has revolutionized the treatment of female stress urinary incontinence. All versions of TVT share in common their retropubic course with a risk of vesical, vascular, or even intestinal injuries [1].

A new, transobturator approach has been proposed [2]. The objective of this anatomical work was to study the course of transobturator tape and to identify the anatomical obstacles encountered.

2. Material and methods

A. This study was conducted on ten female anatomical subjects, who had donated their body to science, aged 74 to 89 years and not preserved in formalin.
B. The transobturator tape was inserted according to the original technique [2].
- The subject was placed in the gynaecological position, with the thighs flexed at an angle of 120°. An 18 F bladder catheter was inserted and the balloon was inflated in the bladder.
- Vaginal incision over Luschka's vaginal tubercle, 1 cm above the urethral meatus and below the bladder neck, indicated by the notch corresponding to the lower edge of the catheter balloon.
- Lateral dissection with Metzenbaum scissors towards the obturator foramen.
- Passage of the tip of the index finger in contact with the inferior border of the obturator foramen. The shortest distance was determined with the thumb, generally corresponding to a point situated lateral to labium majorum at the level of or slightly above (clitoris) the urethral meatus.

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- Bilateral punctate femoral incision lateral to labium majus.
- Insertion of a half-helix needle in the thigh through the adductor muscle insertion fascia and then at the inferior border of the obturator foramen until contact with the finger placed in the vaginal incision by a supination movement.
- The needle was brought out through the vaginal incision, the tape was placed in the eye of the needle and drawn out through the thigh by a pronation movement.
- This procedure was repeated on the other side with an adapted tunnelling device.
- The tape was sutured without tension so that Mayo scissors can be freely passed between the tape and the urethra. It was applied perpendicularly over the middle third of the urethra.

C. A dissection was then performed in the 3 regions concerned by the tape by studying its course plane by plane and by identifying the adjacent structures.

D. One cm thick sections were prepared from the pelvis of one subject after arterial injection of green latex.

3. Results

The results take into account structures situated adjacent to the tape, anatomical variants, and structures concerned by variations of the surgical procedure.

3.1. Structures adjacent to the tape

3.1.1. In the perineum

A. Hymen remnants corresponding to the site of implantation of the perineal membrane constitute the limit between the superficial perineum and the middle perineum. The tape must therefore be passed above the hymen over Luschka's vaginal tubercle, a well defined prominence of the anterior vaginal wall situated slightly below the bladder neck (Fig. 1). At this level, there is a space between the anterior surface of the vagina and the posterior surface of the urethra. This space can be easily cleaved. It corresponds to connective tissue between the tendinous arch of the pelvic fascia superiorly and the superficial perineal fascia inferiorly between perineal fascia and muscles (levator ani, transversus perinei profundus) and the urogenital tract.

B. Lateral opening of this space towards the obturator foramen separates and therefore protects the urethra and vagina. Scissors are introduced into the anterior prolongation of the ischioanal fossa, which separates the levator ani muscles from the transverse perineal membrane and transversus perinei profundus. This dissection using scissors gives the impression of reaching the obturator foramen and that the finger enters the incision; in fact, dissection shows that obturator internus muscle, inserted on the ischiopubic ramus, is always interposed.

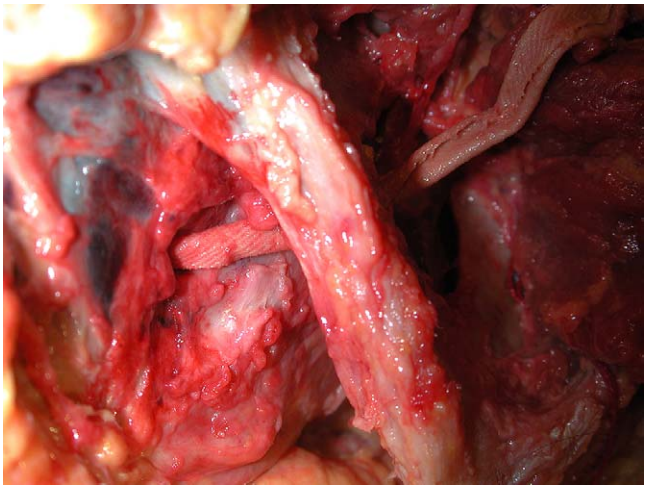

Fig. 1. Perineal dissection: the tape (dotted line) is between the deep transverse (°) and the levator ani (○).

A finger placed in the incision is in contact with muscles inserted on the ischiopubic ramus and the pudendal pedicle, which is situated underneath the obturator internus muscle, passing in the ischioanal fossa between the levator ani and transversus perinei profundus muscles.

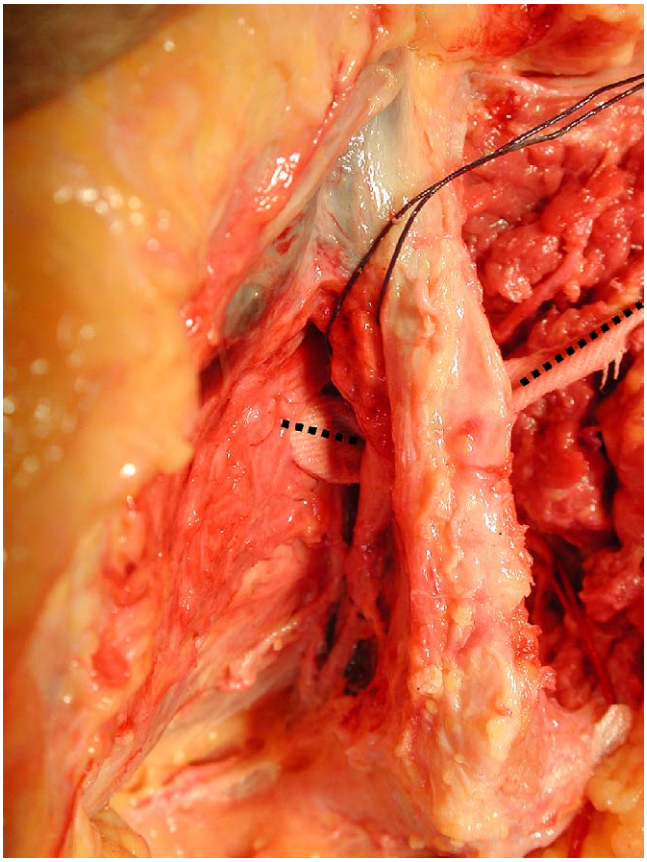

Fig. 2. Perineal dissection: the tape is in the anterior part of the ischioanal fossa; pudendal pedicle is hold by the black thread.