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Intraurethral Laser Therapy: A Solution for SUI III Patient with Extreme Shortly Urethra

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Abstract

We report the case of a 33 year old patient which SUI grade III after spontaneous delivery. During examination we found out that urethra length was only 15 mm. As normal we see a urethra length of 30-50 mm. Due to this extreme short urethra and increased possibility of unwanted outcome we rejected operation with mesh or string. Therefore patient had local estrogen and Yentreve medication. After three month this and alternative pharmaceutical therapy was rejected by the patient. Therefore we had to treat this patient with a new intraurethral laser system. This therapy had a considerable improvement of patients quality of life.

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Introduction

In our clinics SUI grade III patients are in some way daily routine. We have safe diagnostics and due to the long experience of the urogynecological community very good prognosis for our patients. A mesh or sling operation is therefore the most efficient and promising way to get these patients free of symptoms fast and for a long time.

Mesh or sling operation need a minimum of anatomic requirements. One major parameter for a success is that the positioning of sling or mesh along the urethra is done properly. According to the individual anatomic situation each urethra needs its individual sling or mesh position.

A mesh or a sling itself covers approximately 15 mm of the urethra. When a urethra is not longer as the implant, we have just one single position to place it. There is no possibility to adapt properly to the patients anatomy. Under this conditions we can never predict the outcome and therefore we advise against.

Case report

In April 2019, a registered gynecologist transferred a 32-year old patent to our clinics with gynecological anamnese of SUI grade II after spontaneous delivery, patient had no operative interventions before.

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Pop-Q and urodynamics were inconspicuous. During gynecological examination we found front compartment with signs of atrophy, or rectocele and cystocele grade 1, middle compartment with descensus uteri grade 1 and rear compartment with rectocele grade 1. Functional examination with filled bladder showed massive urine leakage when straining and coughing. Vaginal sonography gave us unclear structure with low echo of about 17 x 14 mm right side paraurethral, uterus was retriflectid in the cavum.

Abnormalities we could find during pelvic floor sonography. Funnel formation of the urethra under stress. Sonographic measurement of residual urine gave 20 ml. The most prominent abnormalities were positive palpation test. We diagnosed SUI grade 3, a light hypotension and intrinsic sphincter deficiency. The urethra length we measured was 15.7 mm (bladder filled with 230 ml). In comparable situation a normal length will be about 30 mm.

Therapy I

Our first approach was conservative treatment: 3x local estrogen per week, continuing with regularly pelvic floor exercise and Yentreve medication. And her registered gynecologist had recommended her to use a tampon therapy.

1st recall after three month: Incontinence was improved by estrogen and Yentreve. Functional examination showed still massive urine leakage when straining and coughing. There we recommended to continue the medication scheme. But from the patient we learned, that she heavily opposed to the medication as she has gained weight during the three months period.

Considerations

As we know from our experience, that estrogen as well as Yentreve reduce SUI-symptoms. But continuous medication is required. Discontinuation of estrogen and Yentreve will bring the patient in the same degree of symptoms as before. And the standard operative intervention was no choice, due to the shortness of the urethra. For such a young and active woman we could not take the risk of a negative outcome, followed by life long history of pain and unhappiness.

From our SUI grade 1 cases we had good experience with laser treatment [1]. The treatment concept is a so called microhyperthermia of the pelvic floor tissue. Laser is non-ablative, and works by a pattern of “overheated” but not denatured small single spots in the tissue. (Figure 1) This makes the tissue to produce revascularization and new collagen for better quality of connective tissue. In literature we could find first reports, that intraurethral application of non-ablative thermal load with lasers [2] could as well improve SUI symptoms. The fact, that this treatment could as well be done by intraurethral application of radio frequency devices [3] strengthened our guess that it is a non-ablative thermal effect which is needed for improvement.

Regarding the probability and severe consequences of a negative outcome of a sling or mesh implantation, plus regarding the unwanted side-effects of the medication scheme at this patient and regarding our long experience with non-ablative, thermal application - we had never strong and very seldom slight signs of unwanted side effects - we offered the patient this way of treatment.

Figure 1: Introitus vaginae with typical pattern of non-ablative laser. The same micro-hyperthermia takes place inside the urethra.

Therapy II

As a direct step to enhance her quality of life we shifted from OB-tampons to large vaginal pessaries (Contam extra plus). For a longer lasting effect we added the Laser therapy.

As Laser source we used XS Smooth (Fotona, Slovenia) - Er: YAG-Laser. A special applicator is available for intraurethral therapy. (Figure 2) This one is inserted into the urethra. Laser energy will be applied by moving this applicator stepwise all along the urethra from its proximal end to its orifice. Each step is 2.5 mm, at each step four so-called "smooth"- laser pulses where delivered (6J/cm^2, 1.4 Hz). In one session three passes where applied. The intervention itself took about 15 min. The patient could leave our office and continue with daily routine the same day. In total we had four laser sessions in a 4 weeks interval.

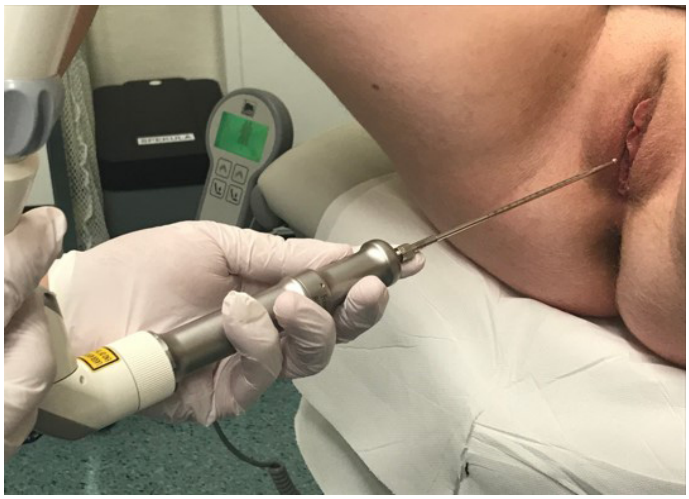

Figure 2: Intraurethral adapter, laser energy can be distributed inside all along the urethra and appeals as non-ablative, microhyperthermia.

Outcome

The first signs of improved situation could be seen already after the 2nd laser session. At recall six month after final laser treatment patient had no more urine loss when normal walking and doing light jogging exercise. She still had urine loss when coughing, but not when mounting stairs. All in all she could re-

duce number of toilet visits and was able do regular light sport activities. We could achieve a significant reduction of pad-test and she reported as well an overall improvement of her quality of life. Sonography showed a visible funnel without urine loss at bladder filling of 250 ml. This situation was stable as well at the latest recall 1 year after last laser treatment.

Discussion & conclusion

SUI is one of the most dominant forms of Urinary Incontinence. Therefore it is not surprising that our urogynecological community has developed effective ways to treat this disease. And in 95% of the cases normal treatment scheme is the one, our patients benefit most. In this case the anatomic situation was such special, that we saw our traditional treatment scheme as a risk and the alternative medication was seen by the patient as not acceptable. By using a non-ablative laser inside the urethra we could achieve a tissue reaction similar to the effect of the laser on pelvic floor. Although the mechanism of this functional tissue regeneration is not known yet, the clinical result seems to be very promising. The intraurethral laser therapy could give us an additional option in treatment of stronger SUI symptoms. At least it is worth to consider this therapy as one possible non-invasive option. In our case we achieved in a very critical situation at least a partly restoration of functional connectivity strength and an improved quality of life for our patient.

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