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Management of Stress Urinary Incontinence in Women with Minimally Invasive Threads Methods

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Abstract

Stress urinary incontinence (SUI) is a prevalent condition, particularly among women, often resulting from factors such as pregnancy, childbirth, aging, and menopause. Traditional treatments, including pelvic floor exercises and medications, may not provide adequate relief for patients with moderate to severe SUI, necessitating more advanced interventions. Recent innovations, such as thread lifting techniques, have been adapted from aesthetic procedures to address pelvic floor dysfunction, offering a minimally invasive solution for SUI.

This article examines the use of biodegradable PLLA/CL threads with multidirectional barbs in treating SUI. The procedure is performed in multiple stages, starting with the marking of entry points, followed by local anesthesia, insertion of barbed threads, and closure of entry points if necessary. The threads stimulate collagen production, strengthening the pelvic tissues and improving bladder control. Clinical outcomes indicate significant improvements in bladder function, increased pelvic floor strength, and enhanced quality of life for patients. Patient satisfaction is high, with minimal downtime and fewer complications compared to traditional surgeries.

While thread lifting shows promising results, further research is needed to confirm its long-term efficacy. Nevertheless, this minimally invasive technique represents a valuable treatment option for women seeking relief from SUI, offering a modern alternative to more invasive procedures.

Keywords: SUI, Pelvic Floor, Functional Gynecology, Threads

Introduction

Stress urinary incontinence (SUI) is a common condition characterized by the involuntary leakage of urine during physical exertion such as coughing, sneezing, or laughing [1]. It is especially prevalent among women, often caused by factors like pregnancy, childbirth, aging, and menopause. While conservative treatments like pelvic floor exercises and medications are often the first line of defense, many women with moderate to severe SUI require more advanced interventions [2, 3].

In recent years, thread lifting techniques, originally developed for aesthetic purposes like facial rejuvenation, have been adapted to address pelvic floor dysfunction, offering a minimally invasive and effective solution for SUI. This article explores the modern thread lifting technique used for treating SUI, focusing on the operational stages of the procedure, results, and overall conclusions [4].

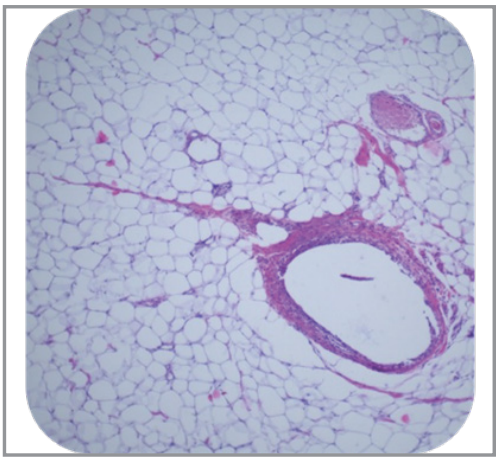
Materials and Methods

The thread lifting techniques for treating stress urinary incontinence involves using biodegradable threads to support the weakened structures of the pelvic floor, particularly around the urethra and bladder neck. Using proper threads for SUI is crucial, in this article is used absorbable PLLA/CL threads with multidirectional barbs, which is 19cm long and inserted in round tip cannula, in the package includes 10 pieces of such type of threads with 18G needle and 23G cannula. (Fig 1)

These threads stimulate collagen production, first due to its composition and the second with the local inflammatory response, and forming connective tissue and elastic fibers, which give us structure and armorisation of the urethral tissues, leading to

strengthened pelvic tissues and improved bladder control [5]. The procedure is performed in stages, each designed to progressively support the pelvic floor and restore urinary function. (Fig 2)

P(LA/CL) thread + HA USP 2/0, with multidirectional barbs 120 mm,
15 pcs Atraumatic rounded tip cannula with the hole aside 20Gx120 mm, 15 pcs
Hypodermic needle 18Gx40 mm, 1pcs



Evaluation of inflammatory response as fibrotic tissue formation around the threads, its thickness, cellular composition, collagen and elastic fibers

Procedure Technique

Stage 1: Entry Point and Schematic Insertion of the Product

The procedure begins with careful patient evaluation and preparation. Once the patient is positioned comfortably and under local anesthesia, the entry points for the needle are marked [6]. Typically, these entry points are located along the skin just below the urethra, extending towards the upper vaginal wall (Fig 3) The specific locations of these points depend on the individual patient's anatomy and the severity of their SUI.

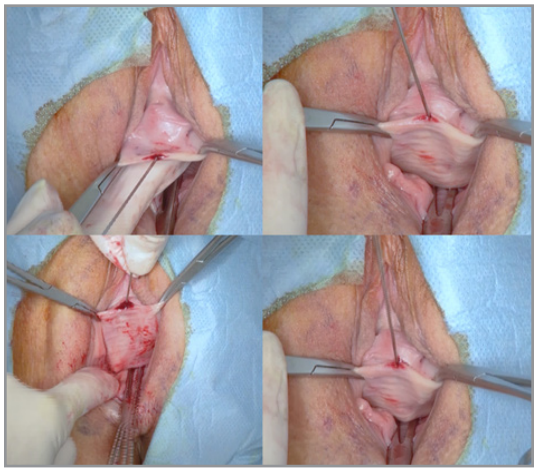
Entry Point and schematic insertion of the product

Local anesthesia is then administered using a 23-gauge cannula to numb the mucose and underlying tissues in the targeted areas. The local anesthesia ensures that the procedure is comfortable and free of pain for the patient.

After numbing, an 18-gauge needle is used to puncture the skin at the marked entry points. This step prepares the area for the insertion of the threads and ensures that the procedure can be performed with precision and minimal discomfort.

Stage 2: Insertion of Multidirectional Barbed Threads

The first set of threads introduced during the procedure are multidirectional barbed threads. These threads have barbs that allow them to grip the surrounding tissue, providing immediate mechanical support to the pelvic floor. The insertion of the threads follows a fan technique (Fig 4) which is designed to distribute the threads evenly across the targeted area under the urethra [7, 8].



a. Entry point is located under the urethral entrance, first insertion of the tip of the thread cannula.
b. moving thread along the upper wall of the vagina,
c.d checking the depth of thread insertion, fan technique implantation.

The insertion of 5 threads into the upper vaginal wall is performed using a cannula, which ensures minimal tissue disruption. These multidirectional barbed threads are strategically placed to lift and support the bladder neck and urethra, helping to restore urinary continence [9]. The fan technique is ideal for creating a broad and even distribution of threads, improving the overall effectiveness of the lift.

Stage 4: Closing the Entry Point (if necessary)

In some cases, particularly when there is a risk of thread extrusion or discomfort, the entry points are closed using 5/0 PDS suture material. This step helps to prevent the threads from migrating or extruding from the insertion sites, ensuring that the threads remain in place and provide optimal support. The sutures are used in a minimally invasive manner, causing minimal scarring and promoting quick healing.

Results

Effectiveness of the Procedure

The thread implantation procedure for stress urinary incontinence has demonstrated significant effectiveness in reducing the frequency and severity of incontinence episodes. Many patients report immediate improvements in bladder control, with reduced leakage during physical activity such as coughing, laughing, or exercising.

In clinical studies, patients who underwent the thread lifting procedure showed:

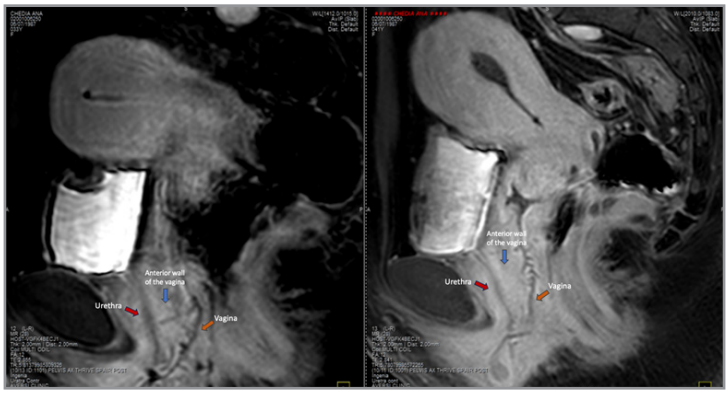
• Improved bladder control with a reduction in incontinence episodes.

• Correction of the urethra along its way - urethra become narrower, its walls have become denser.

• Increased pelvic floor strength, as the collagen produced by the biodegradable threads enhances the structure of the tissues between urethra and vagina. The walls of the vagina are dense, the folds are clearly expressed. (Fig 5)

• Vagina has more shaped form

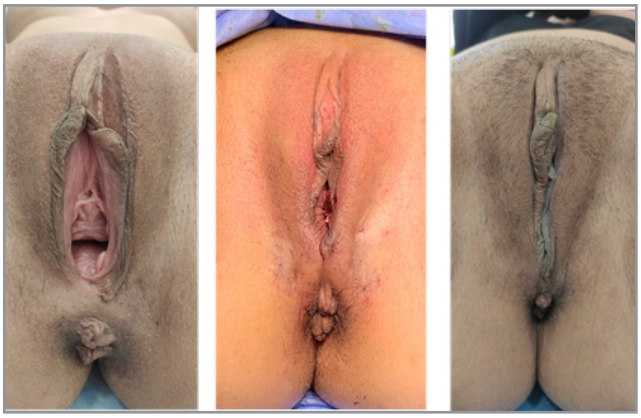
• Enhanced quality of life, with many patients reporting greater confidence and fewer social and emotional limitations due to urinary leakage.



The results of treatment of stress urinary incontinence using the Aptos method are easily confirmed by CT studies.
we encounter one of the cases. In front of you is a CT scan of the patient (01/17/2020) - on the left, after (07/28/2020) - on the right. “BEFORE”, i.e. after 6 months. The walls of the urethra are vague, shapeless, the urethra is expanded throughout and especially in the middle, the outlet is also enlarged and has the shape of a triangle.
The interurethro-vaginal space (wall) is of loose consistency, the vaginal walls are shapeless, the folds are not very pronounced “AFTER” The urethra has become narrower, its walls have become denser, the interurethro-vaginal space (front wall) is of dense consistency. The walls of the vagina are dense, the folds are clearly expressed.

Patient Satisfaction

Patient satisfaction with thread lifting for SUI is generally high. Patients appreciate the minimally invasive nature of the procedure, which does not require large incisions or lengthy recovery periods. Minimal downtime and quick recovery are significant advantages, as most patients can return to their normal activities within a few days after the procedure.
Additionally, because the procedure is performed under local anesthesia, it has fewer risks compared to traditional surgeries. The gradual improvements in bladder control, achieved through collagen stimulation and mechanical lifting, provide long-lasting benefits without the need for repeated treatments. (Fig 6)



a. Before procedure, patients have expressed cystocele, wide entrance of vagina orifice, laxity of the vagina walls, stress urinary incontinence.
b. After procedure, patients were treated with threads, vagina wall is corrected and elevated, vagina entrance is closed, upper wall was restored and improved SUI, perineoplasty.
c. After 6 months of the procedure.

Complications and Considerations

While the thread lifting procedure is generally well-tolerated, some potential risks include:

- Mild bruising or swelling at the insertion sites, which typically resolves within a few days.
- Discomfort or mild pain during the procedure or in the early recovery period.
- In rare cases, thread migration or extrusion, which can be minimized with proper suture closure or by ensuring the threads are placed correctly during the procedure.

Patients with more severe SUI or those with advanced pelvic organ prolapse may not experience as significant a benefit from thread lifting alone and may require additional treatments or a combination of therapies to achieve optimal results.

Conclusion

Thread lifting techniques for treating stress urinary incontinence represent a significant advancement in the management of this common condition. The procedure provides an effective, minimally invasive option for women suffering from moderate SUI who have not responded well to conservative treatments. By using a combination of barbed threads for mechanical support and structural reinforcement, the procedure offers both immediate relief and long-term improvement in bladder control. (Fig 7)

a. Patient before, have expressed severe cystocele and rectocele.
b. Patients after 6 months of using multidirectional barb for treating upper and lower wall of vagina, cystocele and rectocele is corrected.

The operation is performed in multiple stages, with careful marking of entry points, strategic thread insertion, and, when necessary, closure of the entry sites to prevent thread extrusion. Patients typically experience minimal downtime and significant improvements in their condition, making thread lifting a promising alternative to more invasive surgical procedures.

While further research is needed to establish the long-term durability and effectiveness of thread lifting for SUI, the initial results are highly encouraging. The procedure's ability to strengthen the pelvic floor and restore urinary continence without the need for major surgery positions it as a valuable tool in the treatment of stress urinary incontinence, providing a modern, minimally invasive solution for those seeking relief.

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