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PDO threads for the treatment of abdominal skin laxity: description of the technique

PDO threads for abdominal laxity

Descrição de técnica de aplicação de fios de PDO para tratamento de flacidez cutânea abdominal

Fios de PDO para flacidez abdominal

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ABSTRACT

Polydioxanone (PDO) threads have been used as a non-surgical alternative to treat skin laxity. This article describes the technique of applying mono, twin, and screw PDO threads around the umbilical scar forming a support mesh on the abdominal wall, to pull the skin in this region in the opposite direction to gravity. The authors present the results obtained with the technique one and four months after the procedure, showing the improvement of tissue connection with the repositioning of the abdominal scar and general aesthetic improvement.

Keywords: Scar; Esthetics; Cosmetic Techniques; Skin; Polydioxanone; Methods

RESUMO

A aplicação de fios de polidioxanona (PDO) tem sido utilizada como alternativa não cirúrgica para o tratamento da flacidez cutânea. Este artigo apresenta a descrição da técnica de aplicação de fios de PDO liso, twin e parafuso ao redor da cicatriz umbilical, formando uma malha de sustentação na parede abdominal, a fim de tracionar a pele desta região no sentido oposto ao da gravidade. Os autores apresentam os resultados obtidos com a técnica, um e quatro meses após o procedimento, mostrando a melhora da conexão tecidual, com o reposicionamento da cicatriz abdominal e melhora estética geral.

Palavras-chave: Cicatriz; Estética; Técnicas Cosméticas; Pele; Polidioxanona; Métodos

Case Report

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INTRODUCTION

Surgical treatment was the gold standard for many aesthetic aspects of aging for many years. However, the growing demand from patients for aesthetic improvements, with minimal risk and rapid recovery, has encouraged the development of non-surgical rejuvenation techniques.¹ Approximately 10-20% of patients undergoing abdominoplasty suffer local complications, such as seroma, hematoma, infection, necrosis, suture dehiscence, hypertrophic scarring, and asymmetries, and up to 1% of patients suffer systemic complications, such as pulmonary thromboembolism, respiratory depression, and death.^{2,3}

Polydioxanone threads (PDO) offer a non-surgical alternative for correcting the umbilical scar descent and stimulating local collagen.^{4,5} Polydioxanone is an absorbable synthetic polymer that has low tissue reactivity.⁶ The duration in the body is approximately 180 days, but its aesthetic effects last up to two years.⁷ The threads are applied using the thread embedding acupuncture (TEA) technique, where the threads are introduced inside a needle, remaining in the superficial subcutaneous tissue after removal of the needle.^{8,9}

The surrounding tissue is stimulated as the body absorbs the polydioxanone is absorbed by the body.^{4,5,10,11} Histological studies show that, after one month, neocollagenesis is stimulated, with an increase in the number of fibroblasts, myofibroblasts, and blood capillaries. After three months, the collagen fibers become thicker, and there is an improvement in the connection between the dermis and the deep fascia through the strengthening of the connective septa.^{7,10} The increased collagen production remains for over a year, even after thread fragmentation.^{4,12}

The mechanism of action of PDO threads occurs in several ways, including tissue trauma due to needle insertion; mechanical tension, inducing the myofibroblast differentiation and generating tissue contraction; and chemical stimulus, by generating an inflammatory process by the presence of the implant.^{4,13-15}

There are several PDO thread architectures available on the market. The spiculated thread has small barbed spicules, the laser cut 360 degrees around the thread promoting traction and repositioning of the tissues in addition to chemical and mechanical biostimulation, with an elevation of the skin in the anti-gravity direction. Smooth threads can be mono, twin, screw, or twin screw, among others. Twin mono threads are two monofilaments that come out of the same needle, and screw threads are monofilaments twisted inside the needle to increase its diameter and the contact surface with the fabric.

Also, there are several techniques for applying the threads, including parallel, crossed, and V-shaped fan.¹⁴ The crossing of the threads produces a reinforced support mesh, increasing the stimulus of neocollagenesis due to the greater polydioxanone concentration in the treated tissue.

METHODS

We selected a 43-year-old woman with a body mass in-

dex (BMI) of 19.9 kg/m², two full-term pregnancies, a history of abdominal liposuction 20 years ago, and umbilical hernia correction with complementary flank liposuction two years ago. She had moderate abdominal flaccidity, with dermal-subdermal folding upon movement.

The treatment was concentrated in the upper and central region of the abdomen to promote local collagen stimulation, resulting in traction and aesthetic improvement in the periumbilical area. The authors used mono-twin and screw-type PDO threads (i-THREAD, Hyunday, South Korea) (Figure 1), in a mesh technique, with a distance of 1 cm from each other, forming 5x5 cm squares, as the threads have 5 cm long.

We positioned the patient in the supine position, performed antisepsis on the area to be treated, and applied local anesthesia with topical lidocaine. A vertical line passing through the middle of the umbilical scar and a horizontal line passing over the scar divided the abdominal region. Two lines were then drawn above the umbilical scar, with an interval of 5 cm, and a line 5 cm below the umbilical scar. Two lateral vertical lines to the right of the midline and two to the left were marked at a distance of 5 cm. As a result, we obtained eight 5x5 cm quadrants,

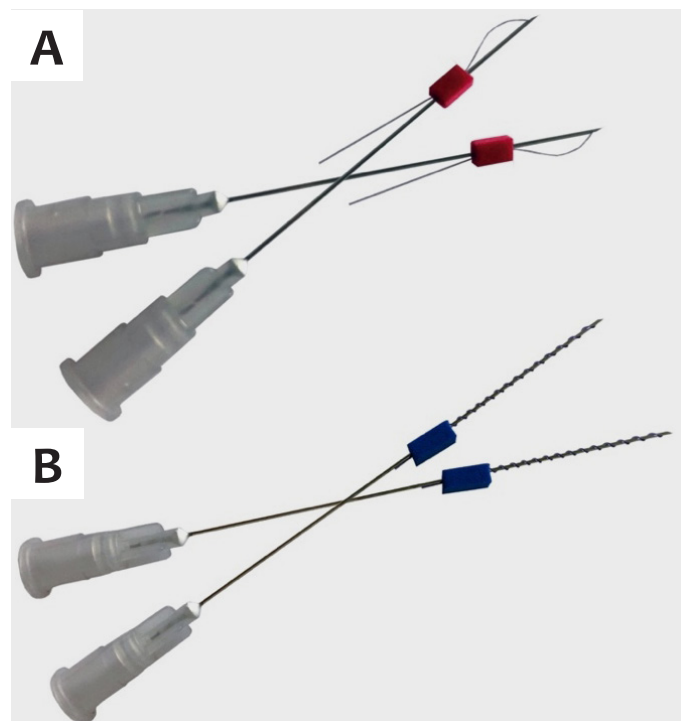


FIGURE 1: A - Twin mono PDO threads formed by two monofilaments in a single needle. Caliber: 27G; needle: 38 mm; thread length: 50 mm. **B** - PDO screw threads formed by monofilament twisted along the needle. Caliber: 27 G; needle: 38 mm, thread length: 50 mm

which served as the basis for the treatment (Figures 2 and 3). The size of the quadrants is defined according to the size of the needle used to ensure full implantation of the thread and avoid extrusion.

The needles are inserted into the superficial subcutaneous tissue every 1 cm in a crisscross fashion, forming 90° angles, remaining in place until the end of the procedure, when they are removed. Then we introduced 5 cm PDO threads (Figures 2 and 4).

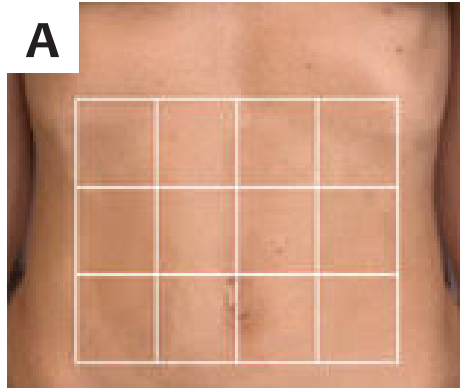
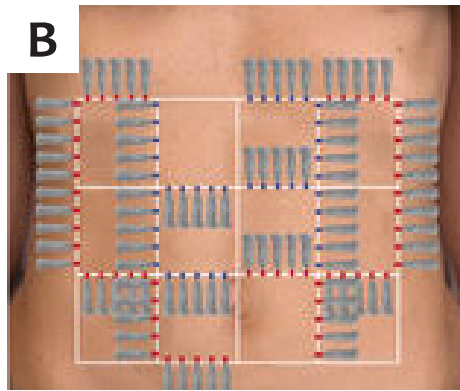


FIGURE 2: A - Schematic drawing of the mesh technique. 5x5 cm quadrants are designed for the use of 50 mm threads.



B - Needles are inserted every 1 cm in the horizontal and vertical directions, forming a supportive polydioxanone network in the superficial subcutaneous tissue

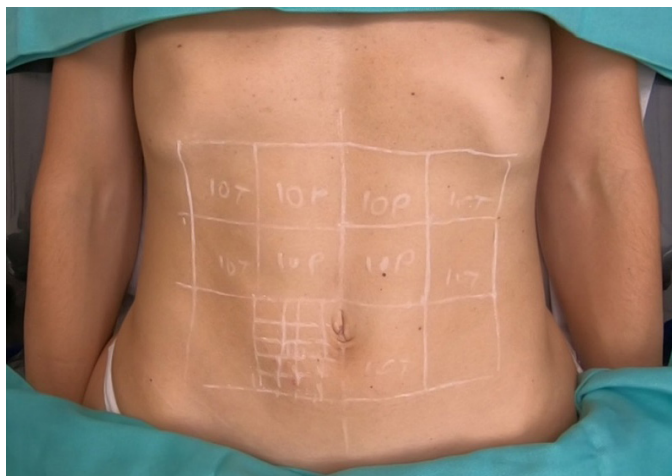


FIGURE 3: Markings made on the patient before the procedure, as described in Figure 2



FIGURE 4: Technique to treat abdominal sagging using 100 PDO threads: 40 screw threads (blue needle barrel) and 60 mono twin threads (red needle barrel). Threads implanted in the superficial subcutaneous tissue

We used 40 screw threads (needle with a blue barrel) to treat the upper-central region of the abdomen, allowing greater collagen stimulation. For the lower-lateral reinforcement, 60 smooth twin threads were used (needle with the red gun).

The needles were removed in a slow, continuous retrograde movement, with compression of the skin with the other hand, minimizing possible bleeding and reducing discomfort. There is no need for bandages, analgesia, or recovery time after the procedure.

RESULTS

We observed significant results after just one session. Figures 5 to 7 show the improvement in sagging after one and four months. Analyzing the photos, a decrease in sagging can be observed when moving and twisting the trunk and the umbilical scar repositioning. The patient had a quick recovery period with an immediate return to usual activities. No complications arose from the procedure. The discomfort reported by the patient was minimal, lasting 48 hours. There was no asymmetry, hematoma, or skin folding.

DISCUSSION

Tissue retraction depends on the endogenous neocollagenesis process and occurs progressively over the subsequent months due to improved dermal-subdermal anchorage.^{4,5,7,9-11} The quantity and architecture of PDO threads influence the result as they determine the biostimulation capacity of the thread and its ability to act as a solid filler. The twin or screw thread

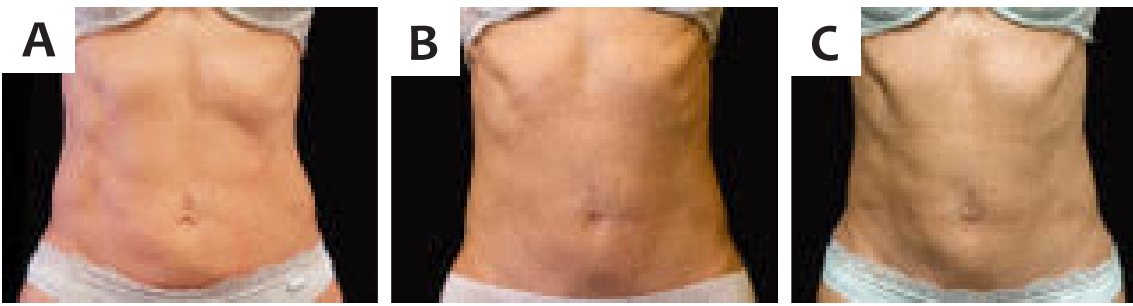


FIGURE 5: Frontal image of the abdomen in extension. **A** - Before the procedure. **B** - One month after the procedure. **C** - Four months after the procedure: improvement in sagging and tissue contraction with reduced skin folding and repositioning of the umbilical scar

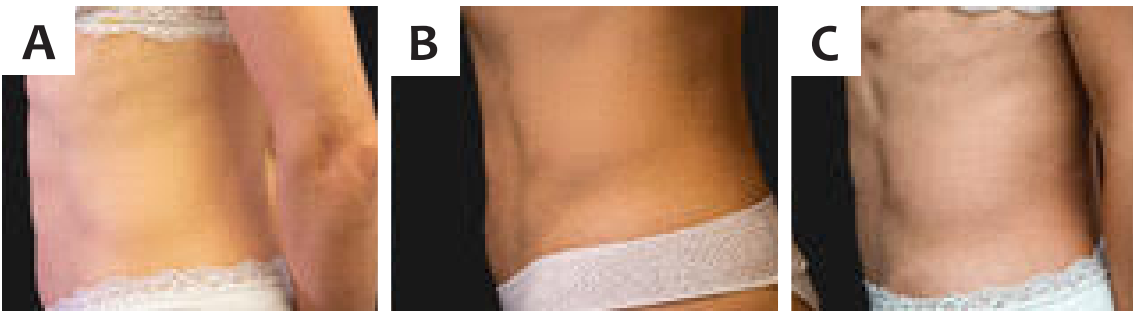


FIGURE 6: Lateral image of the abdomen in extension. **A** - Before the procedure. **B** - One month after the procedure. **C** - Four months after the procedure: improvement in sagging and tissue contraction with reduced skin folding

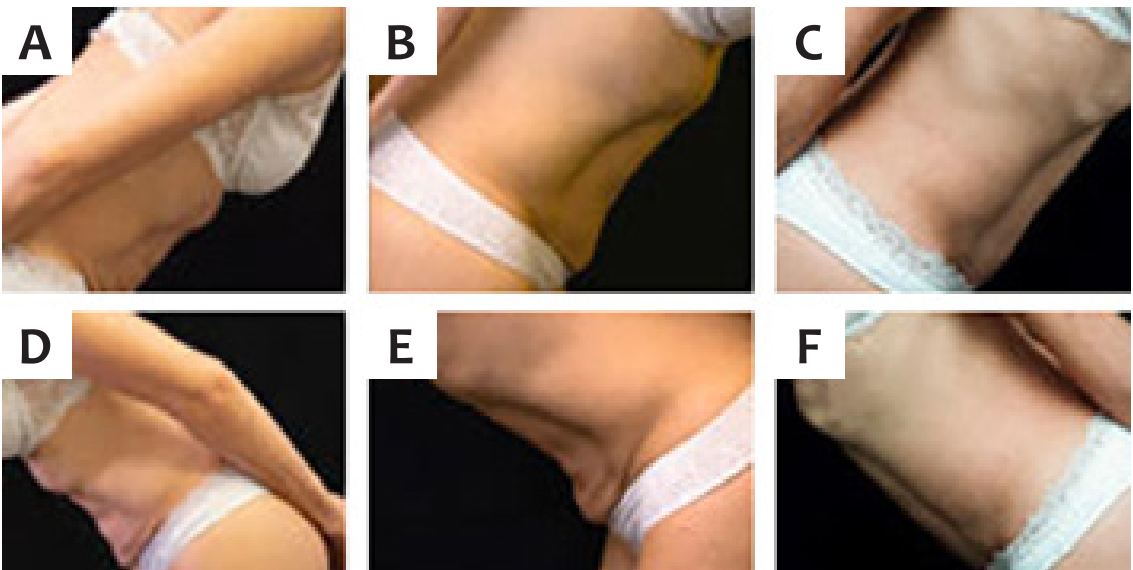


FIGURE 7: **A, B, C, and D** - Right and left lateral images of the abdomen in flexion (**A, D**) before the procedure; (**B, E**) one month after the procedure; and (**C, F**) four months after the procedure: improvement in sagging and tissue contraction with reduced skin folding

increases the support and stimulation of the connective tissue, generating an effect similar to a solid filler.

The selection of the patient was based on the analysis of the body constitution and the presence of abdominal skin

flaccidity. The correct indication of the procedure is necessary to achieve a good clinical response. Patients with a BMI greater than 25 kg/m², with ventral hernias or large abdominal diastasis, are not candidates for treatment with PDO threads. The best

indication for these cases remains abdominal dermolipectomy, whether or not associated with complementary liposuction.³

The implantation of PDO threads is a safe medical procedure.¹⁶ PDO threads are absorbable, and their biochemical behavior has been known for over 30 years,^{6,17} with application in several body areas.

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CONCLUSION

Patients' growing desire for rejuvenation procedures with minimal risk and rapid recovery has led to improved non-surgical technologies. The implantation of PDO threads is a procedure of little technical difficulty and an effective non-surgical alternative to treat abdominal sagging. Its safety and effectiveness depend primarily on the correct indication and precision of planning and marking. It is essential to point out to the patient that the procedure aims to treat sagging skin and not localized fat. ●

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Study design and planning; preparation and writing of the manuscript; collecting, analyzing, and interpreting data; effective participation in research guidance; intellectual participation in propaedeutic and/or therapeutic conduct of studied cases; critical literature review; critical review of the manuscript.

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