



CASE REPORT



Clinical efficiency of polydioxanone threads in the treatment of postpartum abdominal tissue flaccidity: case report

Eficiência clínica de fios de polidioxanona no tratamento da flacidez tissular abdominal pós-parto: relato de caso

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KEYWORDS

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ABSTRACT

This study reports a case of abdominal flaccidity after three pregnancies, in which the technique of smooth and spiculated polydioxanone threads was used, a technique not yet described in the literature to treat this complaint. The patient was followed up for 90 days, but there was an improvement in the opening of the umbilical fold, skin tone, increase in dermal density and especially a reduction in tissue flaccidity in 60 days. During this period, the patient declared that she was completely satisfied, and discharge from treatment was established. With this case report, we can conclude that the combined therapy of PDO threads screws and PDO threads spiculated (Sculpt®) present very expressive results about the quality of the skin, promoting a visible improvement in tissue flaccidity.

PALAVRAS-CHAVE

Abdome
Colágeno
Polidioxanona
Flacidez tissular

RESUMO

Este estudo relata um caso de flacidez abdominal após 3 gestações no qual foi utilizada a técnica de fios de polidioxanona (PDO) lisos e espiculados, técnica ainda não descrita na literatura para tratar esta queixa. A paciente foi acompanhada por 90 dias, e houve melhora da abertura da prega umbilical, do tônus da pele, de densidade dérmica e da flacidez tissular após 60 dias. Neste período, a paciente declarou estar totalmente satisfeita e foi estabelecida a alta do tratamento. Com este presente relato de caso podemos concluir que a terapia combinada de fios de PDO parafusos e fios de PDO espiculados (Sculpt®) apresentam resultados muito expressivos em relação a qualidade da pele promovendo melhora visível na flacidez tissular.

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INTRODUCTION

Tissue sagging is a common complaint associated with chronological aging, photoaging, or substantial changes in body dimensions during pregnancy or weight loss¹. During pregnancy, essential changes occur in the structure of the extracellular matrix, which contains collagen, elastic, and reticular fibers and provides tone and elasticity to the skin and abdominal supporting connective tissue, culminating in sagging of this region. The tissues loosen, ptosate, and suffer premature aging, generating asymmetrical spots².

Several treatments have been suggested to reduce the effects of aging, seeking to delay skin wear. For these dysfunctions, ablative procedures, such as lasers and radiofrequency^{1,3}, are currently presented as non-invasive options for collagen remodeling, whereas collagen biostimulators, such as poly-L-lactic acid and calcium hydroxyapatite^{4,5}, represent injectable treatments. Ablative or non-ablative resurfacing techniques improve the skin's surface but do not adequately lift the underlying ptotic tissues, which is crucial in achieving a more youthful appearance. Therefore, only surgical procedures and their risks to the patient's health and maintenance of life remain⁶.

Percutaneous collagen induction therapy by applying polydioxanone (PDO) threads has been a treatment option for integumentary tissue dysfunctions because it presents some advantages, such as not producing an ablative effect on the skin and minimizing skin recovery time and side effects, in addition to not presenting the risks and costs resulting from plastic surgery. The PDO thread procedure involves passing sutures under the skin, with adequate planning to compensate for ptosis and resize tissue sagging, providing the basis for repositioning and supporting subcutaneous tissues. This procedure avoids large incisions, is performed on an outpatient basis under local anesthesia, and has a short recovery period⁷. Although the use of threads for aesthetic treatments dates back to 1956 by Dr. N. Buttkevit, its results were not yet widely known, and it was only after 1990 that materials and methods took their first steps toward updating with new technologies⁸.

PDO threads represent a revolutionary possibility for body esthetic treatments. Several PDO devices are common in South Korea, despite few studies on the subject. The few clinical studies that exist have a level of evidence of III⁷, at most. However, the benefits compared with the possibilities of complications encourage innovative studies to use this technique. Minor and temporary complications include asymmetry, ecchymosis, erythema, hematoma, edema, and discomfort⁷. Migration, thread extrusion, and scar formation at the entry and exit sites are late complications⁷.

The possibility of using PDO threads is enormous, but further studies are required, given the rapid evolution of new types of threads for different applications. Therefore, the objective of this study was to evaluate, through the description of a clinical case, the efficiency of a mixed protocol of application of PDO threads (smooth and spiculated threads) for treating body sagging in the supraumbilical abdominal region of

a woman with a history of pregnancies.

CASE REPORT

This study was conducted at the Clinic Biomedicina Estética in January 2022 and was approved by the Research Ethics Committee of the Universidade Metodista de São Paulo (CAAE 68547623.0.0000.5508). A biological female patient, 39 years old, weighing 73 kg and 1.72 m tall, visited the clinic in February 2022 complaining of abdominal sagging. In the clinical history, three previous pregnancies were reported. Physical assessment confirmed abdominal flaccidity (Figures 1A, 2A, and 3A).

As there was no abdominal fat, excess skin, or any other contraindication, such as allergies and keloids, we planned to use the mixed technique of screw PDO threads and spiculated PDO threads (Sculpt®; i-Thread, Seoul, South Korea), using the dense shielding mesh technique in the total abdominal region to produce tension and intense collagen stimulation, and the spiculated threads to reposition the tissue, as illustrated in Figure 4.

For application, the research participant was sterilized with 2% chlorhexidine digluconate (Rioquímica, São José do Rio Preto, SP, Brazil) with gauze. Planning and demarcation were performed using an appropriate white pencil and the thread size to be inserted as a basis. Before application, local anesthesia was administered to the papule with 2% lidocaine hydrochloride without a vasoconstrictor (Xylestesin®, Cristália, Itapira, SP, Brazil) using a 1 mL syringe and 30 G needle.

To apply the 10 spiculated threads, they were placed pertuitously at a 45° degree angle with a 21 G needle at the entry points for thread application, according to the tip of the black arrows in Figure 4. The cannulas were removed, leaving only the spiculated threads in the subcutaneous tissue region and the end of the thread in the external region (Figure 5). The professional held the external end while she performed a vertical upward massage, aiming to anchor the hair spicules, restructure the ripple tissue, and promote the lifting effect. The excess thread was removed using scissors.

To apply the 40 needled screw threads, it was not necessary to make a previous perforation for insertion. The needles were inserted completely to fully apply the threads in the planned location, followed by removal of the needle to deposit the thread in the subcutaneous tissue (Figure 4, red arrows). The total surgery time was approximately 60 min.

The patient was evaluated at different post-procedure periods using standardized photographs. The following periods were used to evaluate the results: preoperative (baseline) and postoperative (immediate, 30, 60, and 90 days).

The results are described in Table 1. The immediate lifting result was not very significant in the visual comparison. After 30 days, an improvement in the umbilical fold and dermal density was noted. After 60 days, a significant result was noted in opening the umbilical fold, improving skin tone, increasing dermal



Figure 1 – Photograph of the abdominal region, in an upright position. In A, image before the procedure. In B, image recorded 60 days after application of PDO threads.



Figure 2 – Photograph of the abdominal region, demonstrating the sagging of the skin in a horizontal direction. In A, image before of procedure. In B, image registered after 60 days from the application of the PDO wires.



Figure 3 – Photograph from the abdominal region, demonstrating the sagging of skin in a vertical direction. In A, image before the procedure. In B, image recorded 60 days after application of PDO threads.

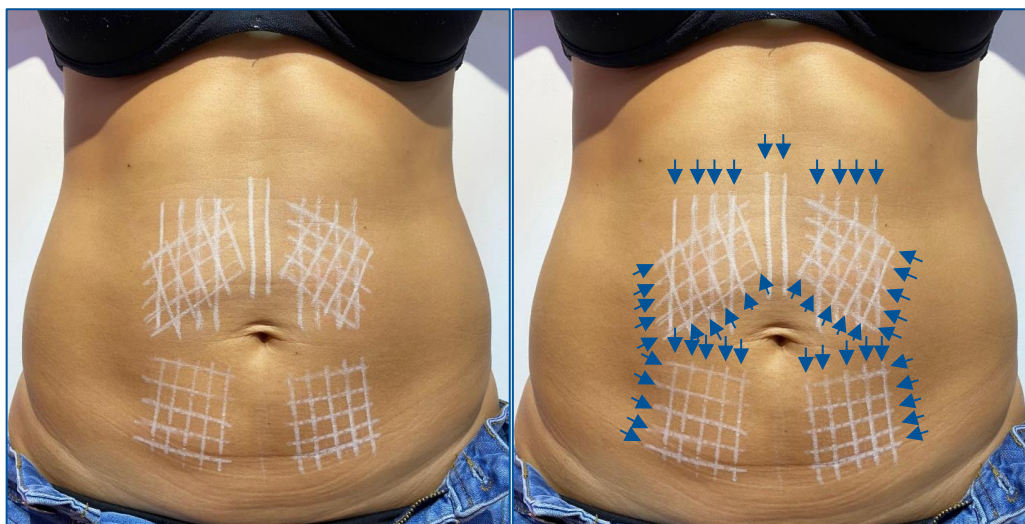


Figure 4 – Photograph from the abdominal region, demonstrating the planning and direction of application of PDO threads. The black arrows represent the application plan for the 10 spiculated threads, positioned vertically to promote tissue repositioning (lifting) and collagen stimulation. The red arrows represent the application of 40 screw threads, arranged in a mesh, to promote collagen stimulation.



Figure 5 – Photograph from the abdominal region during the procedure. The 100 spiked threads were inserted into the subcutaneous layer and their external ends allows the repositioning of the tissue to accommodate the spikes, promoting the lifting effect.

density, and significantly reducing tissue sagging. Photographs taken after 60 days are illustrated in Figures 1B, 2B, and 3B.

The patient was invited to participate and disclose her results. She agreed to participate in the study and disclose her results, as expressed in the informed consent form.

DISCUSSION

To treat abdominal tissue flaccidity, the smooth and spiculated PDO thread technique was planned and executed. Despite its wide use by dermatologists and other health professionals who treat dermatophysiological changes, to the best of our knowledge, there is no description in the literature about the use of mixed techniques with 2 different types of threads. Therefore, this represents a promising protocol for analysis.

In a Brazilian study conducted with 688 women aged 18 to 49 years, approximately 60% intended to become pregnant; in other words, the expectation of women who may complain of post-pregnancy sagging is high. In this scenario, effective and long-lasting methods that require few interventions and high power to activate the endogenous collagen and elastin production cascade are necessary⁹.

The mechanisms that cause tissue sagging are similar to those of aging: atrophy and reduction in epidermal and dermal thickness, fragmentation of elastic fibers, and reduction in the number and function of apocrine glands¹⁰. The endocrine role in the tissue quality of the abdomen must also be considered because there is a relationship between testosterone and estrogen levels and the amount of collagen altered during pregnancy^{9,11}.

PDO threads are approved by the US Food and Drug Administration (FDA) and the National Health Surveillance Agency (ANVISA) for approximating tissues to the skin of the face or body. Several clinical and experimental studies have demonstrated the effectiveness of using PDO threads. A comparative study of different types of absorbable sutures performed in mice demonstrated that the use of multiple PDO sutures produced collagen (Col1 α 1 and Col1 α 3) within 2 weeks after insertion and up to 3 months, as confirmed by analysis of biopsies and

Table 1 – Results observed us periods evaluated before It is after O procedure with wires of polydioxanone (PDO) in the abdominal region.

| | Assessment physical carried out by professional | Report from the patient |
|-----------------------|---|---|
| Baseline | - Absence in fat abdominal - Absence in excess in skin - Flaccidity | - Abdominal flaccidity after three pregnancies |
| Immediate post | - Non-expressive <i>lifting</i> | - Bearable pain, felt only when applying the anesthetic |
| After 30 days | - Improvement in the umbilicus and dermal density | - Perception in discreet improvement. |
| After 60 days | - Opening of the umbilicus, improvement in skin tone, increased dermal density, and, especially, reduction from the tissue sagging - Patient discharge | - Satisfaction achieved |
| After 90 days | There was no assessment after 90 days because the satisfaction was achieved at 60 days. | |

molecular biology techniques¹². A prospective clinical study evaluated and followed up patients for 24 months after thread application and observed significant lasting effects, including skin lifting of 3 to 10 mm and a high degree of patient satisfaction with a lower incidence rate of complications, approximately 4.8%¹³. These results align with those observed in this report, as they were satisfactory from 30 days after the procedure and without complications. It is important to report the side effects most described in the literature: pain, hypodermic bleeding, hematoma, mild asymmetry, and loose threads on the skin surface^{13,14}. Histopathological studies showed fibrosis around the PDO and clusters of lymphocytes, histiocytes, and aerotropism¹⁵.

Although the success of threads in facial rejuvenation and lifting treatments is well established in national and international practices, especially in South Korea, acute and late complications after using thread types can be reported. Non-absorbable sutures, which remain permanently in the tissue, can result in several complications, including inflammation and occasional extrusion of sutures through the skin. Therefore, absorbable sutures, such as PDO, have the advantage of causing fewer late complications because they are fully absorbed by the body in 4 to 6 months¹⁶. Kaminer et al. conducted an experimental study

describing post-procedure side effects and observed swelling, bruising, wire extrusion, and ear numbness. The risk of complications increased with the number of threads used¹⁷. However, the benefits of PDO include a short recovery time, minimal scarring, good tissue lifting, and a high patient satisfaction rate, which outweighs the benefits of plastic surgery, including the cost.

Therefore, with this unprecedented description of the combination of smooth and spiky threads to improve flaccidity in the abdominal region, we can suggest that the method was effective and can be used for this complaint by experienced and qualified professionals under careful biosafety. Complications associated with the procedure must be discussed with the patient before treatment, and we strongly advise postoperative monitoring for 60 days for early identification of side effects.

CONCLUSION

The combined therapy of screw PDO threads and spiculated PDO threads (Sculpt®) presents significant results in terms of skin quality, promoting visible improvement in tissue sagging.

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Data collection: PCG, JB, JRP

Essay of manuscript: JRP

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