



Combined regenerative therapy of post-operative traumatic Vulvodynia: A Case Report

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Abstract

Vulvodynia is a pathology characterized by chronic vulvar pain, with no defined cause, classified as generalized or localized, depending on the presence or absence of pain stimuli. It is difficult to manage with very low cure or improvement rates. This does not mean, however, that new alternative therapies are undertaken to reduce pain and restore sexual function, among other conditions. This clinical case study evaluated the effectiveness of combined regenerative therapy in post-operative traumatic vulvodynia in a 25-year-old nulliparous female patient with no comorbidity history; she was evaluated one-year post-surgery for vulvar and perineal trauma in the Pelvic Floor Rehabilitation Unit (PFRU) for presenting severe vulvar pain, urinary and fecal incontinence, without active sexual life. With prior informed consent, she was treated for severe pain (8 - 10) measured on the Visual Analog Scale (VAS); combined regenerative therapy was applied in-office which included: three sessions every 21 days of vaginal tightening with CO2 laser and platelet-rich plasma; 10 sessions of shockwave therapy and 14 sessions of pelvic floor rehabilitation with electromagnetic chair. After the third week of therapy, pain progressively decreased, with patient reporting improvement related to urinary and fecal incontinence; she initiated an active sexual life without pain. It was concluded that the therapy is effective in eliminating vulvovaginal and perineal pain; it is a non-invasive, painless procedure that regenerates and strengthens the pelvic floor muscles.

Key words: Vulvodynia, vulvar and perineal trauma, combined regenerative therapy.

Introduction

Vulvar trauma is considered a rare surgical emergency in morbidity statistics, the evaluation will depend on the findings found in the physical examination carried out by a multidisciplinary team, who will expose the conditions of evolution of the patient, as well as the assessment of tissue damage and prompt surgical assistance if the case warrants it. ⁽¹⁾

Scientific reports in the literature on non-obstetric vulvar trauma are scarce, only 10% of women are known to have presented the problem; some of unknown origin and others caused by penetration of postcoital foreign objects, sexual abuse, contusion due to trauma to the vulva due to vehicular accidents. ⁽²⁾ In the latter cause, a vulvar hematoma is produced, which consists of a collection of blood at the level of the soft tissues of the vulva that affects the supporting structure of the pelvic floor, which can be caused by direct vulvar trauma. ⁽³⁾ After a surgical procedure, sequelae of specific pain at the vulvar level originate. ⁽⁴⁾

The International Society for the Study of Vulvovaginal Disease (ISSVD) specified that vulvar pain in those terms was defined as “vulvodynia” which is distinguished as pain that lasts for at least 3 months, without a clear identifiable cause, which may have potential associated factors or, more simply, idiopathic vulvar pain. ⁽⁵⁾

Vulvodynia can be subdivided according to its location, provocation, onset and duration; in this study, vulvodynia was considered to be located by its location in which the involvement of part of the vulva, such as the vestibule, within Hart's line 7 (vestibulodynia), clitoris (clitoridina) and caused by trauma, is described. ⁽⁴⁾ This meant that depending on the location of the pain and the presence of vulvar pain only on touch (provoked), patients are grouped into a type of neuropathic pain that, although it is not a cause of mortality, involves the disability generated by pain. ⁽⁶⁾

Studies have shown a decrease in estrogen receptors in the vulva of women with vulvodynia who underwent physiotherapies, as a

conventional technique to relieve vulvar pain. Of 145 patients, 110 reported improvement in vulvar pain after 10 weekly sessions of physiotherapy. It was also reported that 90% of women had muscle abnormalities in the pelvic floor and the effects were positive.⁽⁷⁾ Among others, recommendations were made for multimodal physiotherapy as a first-line treatment for vulvodynia and chronic pelvic pain. Currently, there is no consensus that allows medical specialists to address vulvodynia in a comprehensive manner, which is why it is recommended to make a good clinical history, review the sexual history, perform a careful physical examination, initiate treatment and follow up the patient to evaluate the response to treatment⁽²⁾.

Today, functional and aesthetic regenerative gynecology offers good results when it comes to relieving the discomfort caused by pain sequelae of a pathology such as post-surgical traumatic vulvodynia, through the rehabilitation of vulvovaginal and pelvic floor lesions, thereby improving the areas affected by trauma and consequently the quality of life of the woman and her sexual activity.^(8,9)

In fact, among the most effective non-surgical regenerative treatments to combat the symptoms of vulvodynia are: shock waves, vaginal tightening and placement of platelet-rich plasma (PRP). Shock waves are widely used in regenerative medicine, to rehabilitate the pelvic floor, treat inflammation and relieve pain, among other indications.⁽¹⁰⁾

These shock waves consist of the controlled emission of ultrasonic pressure waves directed and focused on the areas to be treated; it has a high energy and frequency exposure that allows different ailments that could only be treated surgically before. It is a common therapeutic procedure of first option, totally safe when used it does not cause any pain or require rest or subsequent cures; in addition, its effectiveness has been widely demonstrated in all medical disciplines where it has been applied.⁽¹¹⁾

Shockwave treatment is based on an acoustic wave that carries a lot of energy to painful points and tissues located with subacute, subchronic and chronic conditions; it is known that shock waves, when applied where there is pain, produce an analgesic effect, increase blood circulation and facilitate the repair process.⁽¹¹⁾ In addition to shock waves, vaginal tightening and platelet-rich plasma (PRP) together provide an alternative to achieve a photomodulation therapy effect capable of treating and improving pain and stimulating the pelvic floor muscles^(10, 12). Vaginal tightening is a procedure that bases its use on laser technology to stimulate the production of collagen in vaginal tissues. As collagen regenerates, a decrease in the length and diameter of the vaginal canal is created, producing a tightening effect, the tissues become firmer, more toned and rejuvenated; it can be done for medical or aesthetic reasons.⁽¹³⁾

Just as PRP contributes to restoring the anatomy, appearance and functionality of the vagina, vulva, pelvic floor, endometrium, ovaries, including technologies such as the CO2 laser, it is a minimally invasive technique, without adverse effects.⁽¹³⁾ Using the combination of these techniques as a rehabilitation process, it was shown to have beneficial effects by promoting analgesic effects, and in the long term healing by provoking a process of activation of blood vessels, evidenced by the blood flow of nutrients necessary for the repair of tissues and collagen fibers.

Given that there is little literature describing other needs of patients diagnosed with vulvodynia, it was decided in this case study to evaluate the effectiveness of regenerative therapy combined with the use of joint therapies, through shock waves; vaginal tightening with PRP placement and pelvic rehabilitation with the electromagnetic chair applied to a patient with a diagnosis of postoperative traumatic vulvodynia.

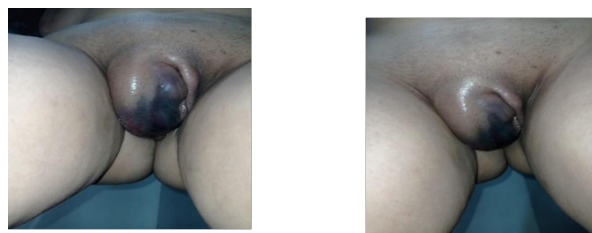
It is expected that the results will serve as an initial contribution in the construction of a bibliographic reference. For rare gynecological pathologies, specifically vulvodynia, where there is a theoretical and research gap on this topic, which would establish a strength in the field of functional and aesthetic regenerative gynecology.

Case Report

A 25-year-old female patient, nulliparous, with no history of comorbidities. She was referred in December 2023 to the Pelvic Floor Rehabilitation Unit (URPP) for presenting intense and constant vulvar pain that prevented her from performing daily activities, sitting or standing for more than 1 hour, wearing tight clothing (jeans), without being able to have sex with her partner; in addition, she occasionally presented urinary and fecal incontinence, after vulvar and perianal trauma caused by a traffic accident as a passenger on a motorcycle for a year (December 2022), at the time, an examination of the external genitalia was performed, observing an increase in volume with a sign of phlogosis, purplish edema and loss of anatomy due to the inflammatory process; it was also painful on palpation (Image 1 and 2).

In this surgical history, prior intervention, clinical examinations (x-rays of the pelvis and chest) and assessment were indicated in conjunction with specialists in the area of gynecology, pelvic floor surgery, urology and plastic surgery. Gynecological examination revealed under speculscopy: vaginal walls, cervix and fundus of sacs without lesions. A globular fluctuating mass involving labia majora, minora, upper pubis was palpated, corresponding to a dissecting hematoma encapsulated in that area extending to the anal region.

During the intervention, the retained blood and clots present approximately between 200 cc and 300 cc were drained. At the suprapubic upper level, a transverse incision was made and blood and clot were extracted from there present approximately 150 to 260 cc, ligation of the active vessels was performed with chronic 3.0, hemostasis and raffia of the interlabial spaces were verified with vicryl 4.0.



Images 1 and 2: External genitalia following trauma.

Six weeks after the postoperative period (Image 3), it is observed that there is still an increase in volume, especially in the vulvar region, with a predominance of the right labia majora, with irradiation of the thigh and pelvis area. Similarly, the pain at that time was of high intensity

(Severe) according to the analogue assessment scale (VAS) of pain, which does not subside with analgesics. However, she was prescribed analgesic (1 pill of Ibuprofen of 800mg) every 8 hours that she consumed from January to December 2023.

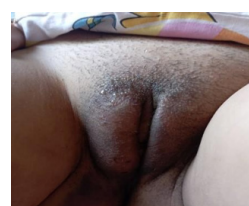


Image 3. Six weeks post-operatively.

A year later, the patient attended the URPP, was evaluated by specialists in functional and aesthetic regenerative gynecology, taking into account the reason for consultation, the following clinical diagnoses were made: 1). Post-traumatic genitourinary syndrome, and 2). Vulvodynia; and manifestation of intense pain. Based on the diagnosis obtained, a vulvovaginal and perianal rehabilitation treatment plan was developed and initiated in February 2024.

In the office, the rehabilitation treatment of combined therapy with shock waves focused on the entire vulvoperianal region was complied with; vaginal tightening with fractional CO2 laser plus placement of PRP throughout the vaginal and periurethral introitus; and pelvic rehabilitation with the electromagnetic chair. At the same time, analgesics are continued to be indicated every 12 hours (1 Ibuprofen pill of 800mg), due to side effects (epigastralgia); currently, she no longer uses analgesics.

After starting rehabilitation therapy, the patient was evaluated in each session with the analog pain rating scale (VAS), reporting clinical improvement in sensitivity in the vulvar area, likewise, she manifested a decrease in pain according to VAS the recognized value between 1 and 3 (mild pain). On the other hand, the patient stated “that urinary incontinence and fecal incontinence were gradually improving”. In short, a new consultation was scheduled six months later (August 2024) to assess and evolve the rehabilitation treatment.

Method

A clinical case of a patient who was referred to the PPCU one year after postoperative surgery due to severe vulvar and perineal trauma caused by a traffic accident on a motorcycle is presented. In the gynecological evaluation, the patient manifested severe pain; it was measured through the Visual Analog Scale (VAS) of pain, which consists of an instrument used mainly for the evaluation of pain symptoms. A numerical scale is presented, usually with a range from 0 to 10, where 0 represents absence of pain and 10 the most intense pain perceived by the patient; the values are classified as: absence of pain (0), discomfort or mild pain (between 1 and 3), moderate pain (between 4 and 7) and intense or severe pain (8-10).⁽¹⁴⁾ VAS is currently universally used because it is practical, reliable, non-invasive, easy to perform and allows us to reassess pain in the same patient at different times.⁽¹⁴⁾ It has been shown that patients are not necessarily influenced by previous scores when asked for new measurements. It should be borne in mind that the score on the scale can vary significantly over time because the perception of pain changes as the hours go by, even if the causative stimulus remains constant.

On the other hand, according to the history of serious impact and diagnoses of Post-Traumatic Genitourinary Syndrome, plus vulvodynia, it was decided to apply combined regenerative therapy in the office. para improving urinary incontinence and sexual dysfunction caused by these symptoms for vulvovaginal and perianal rehabilitation; prior informed consent that she accepted and signed. The scheme of combined regenerative therapy was planned: 10 sessions of shockwaves focused on the entire vulvoperianal region; 14 sessions of pelvic rehabilitation with the electromagnetic chair after the third session; 3 sessions every 21 days, of vaginal tightening with CO2 laser and placement of PRP throughout the vaginal and periurethral introitus, to recover muscle tone through the laser and improve elasticity, thus achieving a tensor reaction. The PRP procedure consisted of extracting 10 cc of blood from the patient, then moving to a sterile blue cap tube, to be centrifuged at 1800 revolutions per minute for 8 min. Following the protocol, platelet-rich and platelet-poor plasma were extracted.⁽¹⁵⁾

Then, the patient put on a disposable gown and on the stretcher in the lithotomy position, local anesthesia cream was placed. Subsequently, a fractional CO2 laser was applied at a power of 8 watts, in the vulvar region, emphasizing the vaginal introitus; subsequently, PRP was infiltrated with an insulin injector and 30GX1/2” needles in the vaginal and periurethral introitus. After each session of regenerative rehabilitation therapy, the patient was evaluated, and a new evaluation was planned after six months.

Results

The results in this case highlight that the patient, before starting the combined regenerative therapy treatment, manifested severe pain (measured in VAS: 8 - 10) of long evolution, without decreasing the intensity with the analgesic treatment every 8 hours, in addition to presenting adverse effects. Once the first and second combined therapy with shock waves focused on the vulvoperianal region was initiated, plus vaginal tightening with CO2 laser and application of PRP in the vaginal and periurethral introitus, she continued to report intense or severe pain, even when sitting in a chair for more than 10 minutes. On the other hand, she exposed the drastic changes in her sexual activity with her partner, highlighting that she did not have a sex life because of the severe pain.

After the assessment of the previous session, and compliance with the third treatment session, the patient manifested a significant decrease in the areas of pain, both in the vulvoperianal region and in the vaginal and periurethral introitus; which indicated that the evolution has been good. The VAS score ranged from 4 – 7 (moderate pain), and sometimes between 1 and 3 (mild pain), continuing with oral analgesics every 12 hours. That is, the pain thresholds were progressively reduced. She also stated that she began sexual relations again, with minimal pain, classified as a nuisance, but not as the pain she had before starting the regenerative treatment.

In the fourth session, pelvic rehabilitation began with the electromagnetic chair, this therapy allowed to treat several alterations including: urinary incontinence and fecal incontinence; restore and/or act on the pelvic floor after surgeries to improve the quality of the sexual life of the patient with vulvodynia. After 14 sessions, it was determined in the patient through questioning that there is a strengthening of the pelvic floor muscles. She also refers to a decrease in urinary and fecal incontinence; an active sex life; currently, she is pain-free, so she does not ingest analgesics.

Discussion

Vulvovaginal trauma is usually caused by direct trauma to the vulva resulting in non-obstetric vulvar hematomas; after surgery to drain the hematoma, tie the bleeding vessels, the symptom of pain is idiopathic,⁽⁴⁾ produced with a duration of at least 3 months, without determinable cause, in which associated factors may be present unrelated to any peripheral nociceptive input or injury or disease of the sensory system, associated with some degree of hyperexcitability.⁽¹⁶⁾

Intense and chronic pain in the vulvar region that can be generalized or localized as a result of trauma is defined as vulvodynia, it is a very rare, multifactorial, highly complex pathology that is difficult to treat; it affects sexual function partially or definitively, and consequently the quality of life of the woman. When the consequence of trauma is physical contact, the pain is permanent with probable alterations in the innervation and with changes at the level of nociceptors due to trauma.^(4,16)

There are no guidelines or consensus on the best practices for the treatment of trauma-related causes. There is little information in the

literature to guide the management of unconventional techniques that provide benefits to patients with vulvodynia. However, combined regenerative therapy has been used in the present study to reduce chronic pain, restore the pelvic floor and sexual function of patients diagnosed with postoperative traumatic vulvodynia.

In this study, the effectiveness of combined regenerative therapy in postoperative traumatic vulvodynia was evaluated, with the use of techniques: shock waves, vaginal tightening with PRP placement and pelvic rehabilitation with electromagnetic chair. In most cases, the efficacy of the treatments has been investigated separately, being classified as effective, non-invasive and painless, which is why, when the therapy was evaluated as a whole, it was possible to verify the effectiveness and safety with greater certainty, with progressive clinical improvement, until the analgesic was omitted.

However, when reporting the results obtained in this study before starting the combined regenerative therapy, pain was evaluated as the reason for the medical attention requested, this was the main symptom measured through VAS, referred to as intense and constant, the value conferred on the scale was between 8 to 10 points, which indicated severe pain, with a history of postoperative vulvovaginal trauma due to a traffic accident with a motorcycle.

The results involving non-obstetric vulvodynia are scarce, they refer to causes that contribute to trying to understand something more about chronic pain, three interdependent systems can be considered: the vulvar mucosa, the pelvic muscles and the neurological pathways. Undoubtedly, vulvodynia must be the result of multifactorial processes, which involve these three systems;⁽¹⁷⁾ that for the purposes of the case study the result of the process is unknown, hence, the greater the intensity of the pain before starting treatment, it may be a predictor of lower results.⁽⁹⁾

On the other hand, it has been shown that, depending on the characteristic of the pain, whether it is primary or secondary, it can constitute a predictive factor of the results of the treatments. However, others have not been able to demonstrate this association.⁽⁵⁾ In this regard, in this study, once the combined therapy was started in the first two sessions, the patient continued with severe pain, this discomfort that did not allow her to have a sex life with her partner, probably due to the fear of the pain that intercourse could cause, but also other activities, such as standing or sitting for a short time.

Subsequently, the results of the third session determined a significant decrease in the areas of pain, both in the vulvoperianal region and in the vaginal and periurethral introitus; which indicated that the evolution of the combined regenerative therapy was decreasing, from moderate pain to mild pain; that is, the pain thresholds have been progressively reduced, even when the administration of oral analgesics continued, which also changed from every 8 hours to every 12 hours. Likewise, sexual intercourse was initiated, with mild pain at times and classified as minimal discomfort.

The above describes that we are dealing with a prevalent disease that is often undiagnosed or misdiagnosed when it is not obstetric; however, it is essential to consider the treatment and monitoring of pain taking into account: location, intensity, physical, emotional and sexual activity. The use of unconventional treatments, including focal shock wave therapies, whose effects promote tissue regeneration and have analgesic effects.⁽¹⁰⁾

Likewise, vaginal tightening with fractional CO2 laser was considered in this combined therapy in order to contract the collagen fibers of the epithelium and create a decrease in the length and diameter of the

vaginal canal, producing a tightening effect; in addition, the CO2 laser to improve urinary incontinence and sexual intercourse.⁽¹⁸⁾ Similarly, for pelvic rehabilitation, the electromagnetic chair was used to correct urinary incontinence, by inducing passive contractions of the urethral sphincter and the muscles of the perineum through electric current, to provoke involuntary muscle contractions and strengthen the muscles of this area.⁽¹⁹⁾ In accordance with what was stated in our study, the patient obtained an improvement in urinary and fecal incontinence; likewise, she reported continuing with an active sexual life without pain, with total incorporation into usual activities. In this clinical case study, a regeneration therapy combined with focal shock waves, vaginal tightening with PRP placement, and pelvic floor rehabilitation using the electromagnetic chair was used as a treatment alternative whose results are viable, and relevant to improve the deterioration of the quality of life that involves both the mental and physical health aspects of the patient. It is expected that further research will be carried out in this line of research, to be attentive to the greater number of women with this pathology whose main symptom is pain. As well as, to establish other types of designs to evaluate the efficacy of regenerative therapy combined with a larger sample number.

Conclusion

Based on the objective, it was determined that each individualized procedure as a whole is non-invasive, painless and helps to support the pelvic floor by restoring vaginal tone and elasticity. In these terms, the effectiveness of combined regenerative therapy was evaluated in the case study that presented the postoperative traumatic vulvodynia pathology. The effect of the combination of focal shock wave therapy, vaginal tightening with PRP placement and pelvic floor rehabilitation through the electromagnetic chair, allowed us to conclude that this therapy is effective in eliminating vulvovaginal and perianal pain, improving urinary and fecal incontinence and provoked sexual dysfunction. Also, renewing the patient's quality of life, increasing positive emotions and personal and family relationships.

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