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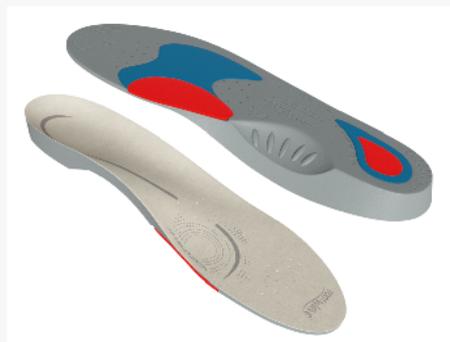
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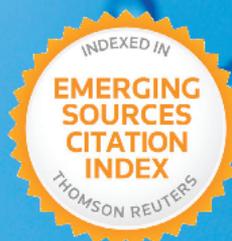
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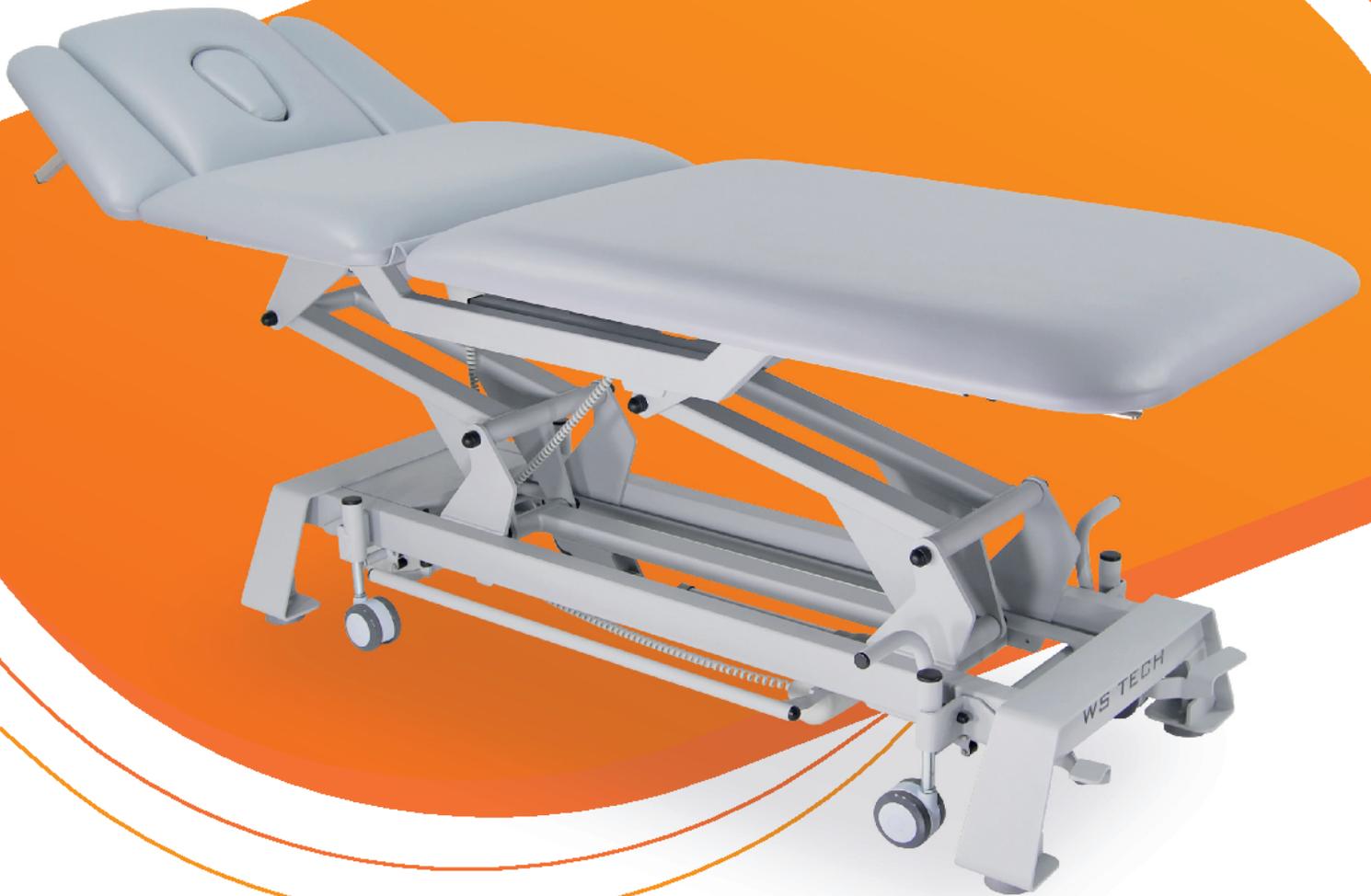


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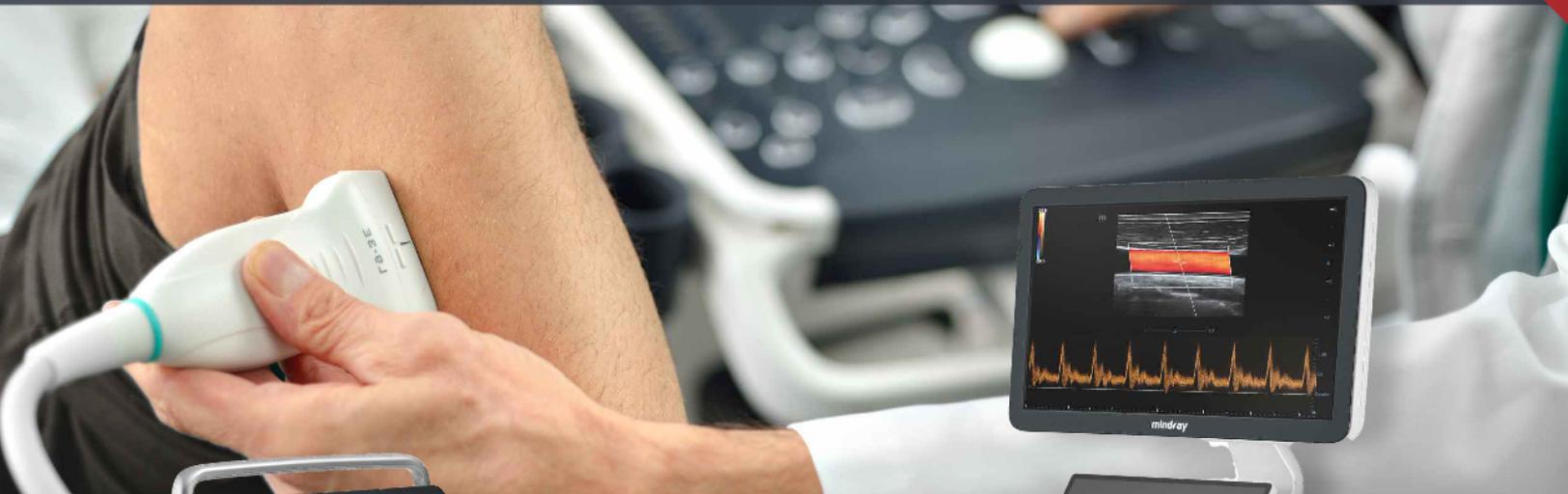
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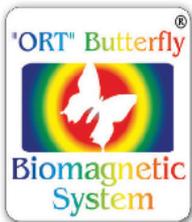
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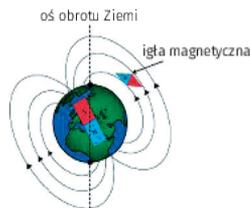
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Possibilities of using physiotherapy after surgical treatment of endometriosis. Case study

Możliwości zastosowania fizjoterapii po operacyjnym leczeniu endometriozy. Studium przypadku

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Abstract

Objective of the study. The aim of the study was to present the role of physiotherapy in women with endometriosis after surgical treatment.

Material and methods. A 35 year old women with endometriosis diagnosed by histopathological examination participated in the study. The study program included a examination and therapy. The examination included an interview and filled a questionnaire: „Endometriosis impact questionnaire (EIQ)”. The physical examination included functional tests and palpation the structure. The therapy included work with scar, diaphragm, abdominal muscle, iliopsoas muscle and sacroiliac joint.

Results. Physiotherapy management is an important part of the comprehensive treatment of patients after surgical intervention for endometriosis. It contributes to the reduction of tension and to the alleviation of pain.

Conclusions. Physiotherapy may plays an important role in the complex treatment of women with Endometriosis.

Key words:

endometriosis, chronic pain, physiotherapy

Streszczenie

Cel pracy. Celem pracy było przedstawienie możliwości fizjoterapii u kobiety po operacyjnym leczeniu endometriozy.

Materiał i metody. W badaniu wzięła udział 35-letnia kobieta ze stwierdzoną w badaniu histopatologicznym endometriozą. W programie badań ujęte zostało badanie podmiotowe, przedmiotowe oraz fizjoterapia. Do badania podmiotowego zaliczał się wywiad oraz wypełnienie kwestionariusza „Kwestionariusz wpływu endometriozy (EIQ)”. Badanie przedmiotowe obejmowało wykonanie testów funkcjonalnych oraz ocenę palpacyjną struktur. W zakresie terapii przeprowadzono mobilizację blizny, techniki rozluźniające/normalizujące napięcie przepony, mięśni brzucha oraz mięśni biodrowo-lędźwiowych.

Wyniki. W wyniku terapii ból zmniejszył się, a jakość blizny poprawiła się. Odpowiedzi Kwestionariusza Wpływu Endometriozy (EIQ) przed i po terapii wskazują na poprawę z zakresu zdrowia fizycznego, psychicznego, społecznego oraz seksualnego pacjentki.

Wnioski. Fizjoterapia może odgrywać istotną rolę w kompleksowym leczeniu kobiet po operacyjnym usunięciu ogniska endometriozy.

Słowa kluczowe:

endometrioza, chroniczny ból, fizjoterapia

Introduction

Endometriosis is a chronic and progressive disease characterized by persistent pelvic pain that can make it difficult to become pregnant and even lead to infertility. It is caused by the presence of glandular cells and endometrial stroma outside the uterine cavity, which undergo hormonal changes during the menstrual cycle. Endometriosis is an oestrogen-dependent inflammatory disease that most often affects women of reproductive age [1, 2, 3].

Risk factors favouring the occurrence of endometriosis include, among others, reproductive age, early first menstruation, menstrual cycles that lasts less than 26 days, prolonged (more than 5 days) and heavy menstrual bleeding, genetic predisposition, malformations in the area of organs formed from the Müllerian ducts, obstructing the outflow of menstrual blood and low body mass index [4]. Symptoms that occur in women with endometriosis include: premenstrual pain, dysmenorrhoea, painful intercourse (dyspareunia), painful ovulation, lower abdominal pain, chronic pelvic pain, painful urination and defecation, pain in the digestive system (e.g. intestines), constipation or diarrhoea, pain in the bladder area, especially during menstrual bleeding, infertility/sterility [1, 2, 3].

Treatment

Currently, endometriosis can be treated by conservative treatment and surgery. Conservative treatment is based on the use of non-steroidal anti-inflammatory drugs (NSAIDs) with anti-inflammatory, analgesic and antipyretic properties. Hormone therapy is also used, which by reducing the level of oestradiol leads to a temporary suppression of endometrial changes. As a result of their inhibition, inflammation decreases or disappears, and pain is alleviated [1, 2, 3]. There are reports of the possibility of alleviating pain using physiotherapy. Physiotherapy is aimed at treating pain-related sexual disorders, such as dyspareunia and dysmenorrhea. Research shows that physiotherapy reduces pain and improves the quality of sexual life in patients suffering from endometriosis [5, 6, 7]. Manual therapy includes soft tissue techniques, such as myofascial relaxation, connective tissue massage, scar mobilization and trigger point therapy. Visceral therapy or mobilization and manipulation of the spine joints are also used [8, 9].

Sometimes it is necessary to use surgery to reduce or eliminate pain resistant to conservative treatment and in the case of infertility related to endometriosis [2, 3].

Objective

The objective of this study was to present the possibilities of physiotherapeutic treatment in a patient after surgical treatment of endometriosis.

Material

A 35-year-old woman, who has never given birth, after surgical treatment for endometriosis, participated in the

study. The patient did not report any comorbidities in her medical history. There was no diagnosed endometriosis in the patient's family history, but dysmenorrhea and dyspareunia were frequent. The first symptoms of endometriosis in the patient appeared in adolescence, with the onset of menstruation, there was pain in the pelvic area, which intensified during ovulation and menstruation. When the patient became sexually active, she began to notice pain depending on the position of the sexual intercourse. The patient did not report any urinary or digestive symptoms.

In order to alleviate significant pain, the patient used painkillers on an ad hoc basis. In the two years preceding the physiotherapeutic program, the patient underwent three surgical procedures: transvaginal removal of the vaginal endometrial cyst, then the left ovary endometrial cyst was removed by laparotomy, and vaginal and rectovaginal septum tumours were removed using the transvaginal method. After the procedures, the patient did not experience any changes in the severity of pain, the analgesic effect appeared only after restarting hormone therapy.

Method

Before entering the physiotherapy program, the patient signed an informed consent to participate in the study.

The study was approved by the Independent Bioethical Committee for Scientific Research, no.: NKBBN/319/2021

The first physiotherapeutic examination was performed eight months after the last surgical procedure. Therapy was carried out for the next four months; it included a total of 24 sessions, each lasting 1.5 hours. The appointments covered four menstrual cycles. At the end of therapy, the physiotherapeutic examination was repeated. The subjective therapeutic effects were assessed on the basis of the Endometriosis Impact Questionnaire. This questionnaire is used to assess the patient's feelings about the impact of endometriosis on her quality of life. The Endometriosis Impact Questionnaire covers three periods of a woman's life: the last 12 months, from 1 to 5 years and over 5 years [15]. The severity of changes can be assessed using the five-point Likert scale, where 0 means definitely no, and 4 means definitely yes [10]. The study compared the period of the last 12 months before treatment with the four months of treatment. In addition, a diagram of the human body was used, on which the patient marked the painful areas. The study also assessed scar quality using the Manchester Scar Scale (MSS) and the Visual Analogue Pain Scale (VAS). The MSS scale is used to assess postoperative scars and wounds. It includes criteria such as: colour, shine, contour, distortion and superficial structure. The maximum number of points is 18. A higher number of points indicates a worse appearance and distortion of the scar [16].

Course of therapy

Physiotherapy included manual work with scar tissue, diaphragm, abdominal muscles and iliopsoas muscles.

Therapy in the area of scar tissue included the performance of massage techniques, such as: stroking along the edges of the scar and flat shifting of the scar tissue along the course

of the scar. Superficial mobilization was used, consisting in the use of a pincer grip with greater intensity and deep mobilization, during which the scar loosens and is mobilized by sinking into the soft tissues surrounding the scar. The last technique used was the lifting technique which involved mobilization across the scar and rolling the skin with a pincer grip during which the scar was initially lifted and then the skin fold formed by the pincer grip was moved [16]. Scar working techniques are shown in Figures 1a, 1b, 1c, 1d, 1e, 1f.



Fig. 1a. Stroking technique



Fig. 1b. Flat shifting technique



Fig. 1c. Superficial scar mobilization



Fig. 1d. Deep scar mobilization



Fig. 1e. Shifting and lifting technique



Fig. 1f. Rolling the skin with a pincer grip

The diaphragm therapy was started with the technique of diaphragm springing, then the technique of manual relaxation of the diaphragm and the ribs stretching technique were used [17, 18]. The patient was also re-educated to breathe through the diaphragm. Techniques for working with the diaphragm are shown in Figures 2a, 2b, 2c.



Fig. 2a. Diaphragm springing technique



Fig. 2b. Diaphragm manual relaxation technique



Fig. 2c. Ribs stretching technique

Manual ischemic compression of the trigger points was used in the treatment of the abdominal muscles and the left iliopsoas muscle, which was more painful and tense during the examination. Constant finger pressure was applied from 20 to 60 seconds, with a gradual increase in pressure as the sensitivity of the trigger points decrease [19].

Results

The patient's symptoms were severe to moderate in the Endometriosis Impact Questionnaire conducted before the commencement of therapy. Out of 27 questions about the severity of the symptoms, the respondent rated 4 symptoms at 4 points (out of a possible 5), and 10 symptoms at 3 points. After therapy, no symptom appeared with an intensity greater than 2 points, moreover, in 16 questions, the patient stated that her symptoms had completely disappeared. Detailed results of the Endometriosis Impact Questionnaire (EIQ) before and after therapy are presented in Table 1. Before starting therapy, during the first physiotherapy examination, the patient obtained 15 points out of 18 in the Manchester Scar Scale (MSS). After the end of therapy, during the final examination, the score was 10 points out of 18. Changes in colour, shine, distortion and superficial structure of the scar were noted. Manchester Scar Scale (MSS) scores before and after therapy are shown in Table 2. In the scar area, pain reduction, improvement in superficial sensation and an increase in scar mobility were also observed (Table 3).

Table 1. Endometriosis Impact Questionnaire (EIQ) scores before and after therapy

Questions	Answer regarding the 12 months before therapy	Answer regarding the 4 months of therapy
I had severe period pains	3 – quite a lot	0 – definitely no
I had pelvic pain between my periods	3 – quite a lot	1 – a little
I had irregular spotting or bleeding between periods	2 – more than usual	1 – a little
I felt more tired than usual	2 – more than usual	0 – definitely no
I spent time in bed or lying down because of pain (e.g. menstrual or pelvic pain)	3 – quite a lot	0 – definitely no
I was having trouble sleeping	2 – more than usual	1 – a little

Questions	Answer regarding the 12 months before therapy	Answer regarding the 4 months of therapy
I felt my energy level dropped	2 – more than usual	0 – definitely no
I had difficulties with everyday activities (shopping, driving)	2 – more than usual	0 – definitely no
I had to reduce my involvement in exercise or sports	3 – quite a lot	0 – definitely no
I was physically troubled by the side effects of treatment or surgery	4 – definitely yes	0 – definitely no
I was worried about weight gain (decreased physical activity due to pain or as a side effect of treatment)	4 – definitely yes	2 – more than usual
I was thinking of having a hysterectomy to treat my symptoms	4 – definitely yes	1 – a little
I was depressed	3 – quite a lot	0 – definitely no
I felt insecure about the unpredictable nature of endometriosis and its symptoms	2 – more than usual	1 – a little
I was not sure of the effectiveness of my treatment	3 – quite a lot	2 – more than usual
I have experienced mood swings (due to symptoms or side effects of the treatment)	2 – more than usual	0 – definitely no
I felt misunderstood by others about how I felt	2 – more than usual	1 – a little
I felt less confident	2 – more than usual	1 – a little
I was dissatisfied with my appearance (due to weight gain or postoperative scars)	4 – definitely yes	2 – more than usual
I was dissatisfied with my appearance (due to weight gain or postoperative scars)	1 – a little	0 – definitely no

Questions	Answer regarding the 12 months before therapy	Answer regarding the 4 months of therapy
I felt jealous (towards people who don't get pain during intercourse)	3 – quite a lot	0 – definitely no
I was worried that my symptoms were getting worse	3 – quite a lot	2 – more than usual
I was worried about the impact endometriosis might have on my future plans	2 – more than usual	0 – definitely no
I was irritated by the amount of painkillers I had to take	3 – quite a lot	0 – definitely no
I was worried about the overuse or random use of painkillers	2 – more than usual	0 – definitely no
I couldn't control my life the way I wanted to	2 – more than usual	0 – definitely no
I felt pain during or after sexual activity	3 – quite a lot	0 – definitely no

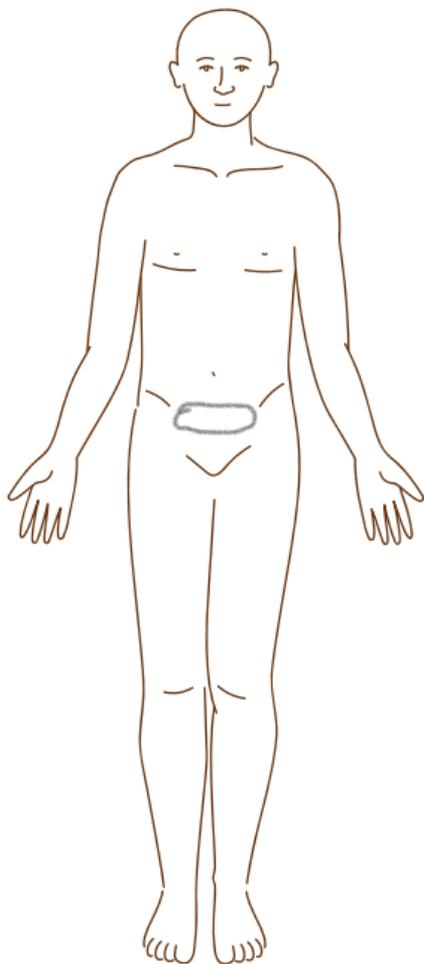
Table 2. Manchester Scar Scale (MSS) scores before and after therapy

Feature	Number of points before therapy	Number of points after therapy
Colour	3	2
Shine	2	1
Contour	2	2
Distortion	4	3
Superficial structure	4	2
Total score	15 / 18	10 / 18

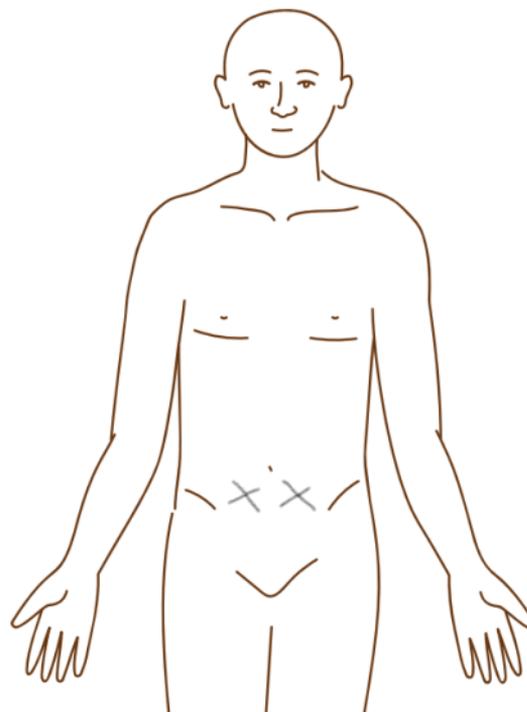
Table 3. Changes in the scar area before and after therapy

Factor	Pre-treatment assessment	Post-treatment assessment
Pain in the area of scar tissue (VAS scale)	3-4 points; 5-6 points (during menstrual bleeding)	0 points; 2-3 points (during menstrual bleeding)
Superficial sensation in the area of scar tissue	There is an area of 4 cm above the scar with lowered sensation	There was no area with lowered sensation above the scar
Areas with reduced mobility	Presence of three areas of reduced mobility in the scar	There are no areas of reduced mobility

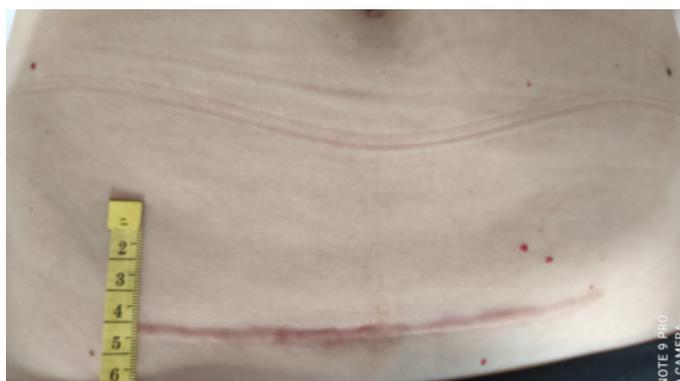
The location of pain before therapy is presented in Figure 3.
The location of the abdominal trigger points before therapy is shown in Figure 4.
The scar before and after therapy is shown in Figures 5a and 5b.



Ryc. 3. Lokalizacja bólu przed terapią
Fig. 3. Pain location before therapy



Ryc. 4. Lokalizacja punktów spustowych w obszarze mięśni brzucha
Fig. 4. The location of trigger points in the area of the abdominal muscles



Ryc. 5a. Obraz blizny przed terapią
Fig. 5a. The scar before therapy



Ryc. 5b. Obraz blizny po terapii
Fig. 5b. The scar after therapy

Assessment of the diaphragm

Before therapy, increased tension was demonstrated on the left side of the diaphragm, which made it difficult for the thumbs to penetrate under the costal margins. Before therapy, tenderness in the diaphragm area was assessed at 2-3 points on the VAS scale. After completing therapy, increased flexibility of the diaphragm area was demonstrated, as well as no pain and tenderness. The tissue tension allowed the thumbs to slide freely under the costal margins.

Assessment of the abdominal muscles

On palpation before therapy, the presence of trigger points in the rectus abdominis muscle (bilaterally) below the navel was examined. The patient rated her pain on the VAS scale at 3-4 points. The pain was located under the therapist's fingers and radiated to the area of the reproductive organs. After therapy, the patient felt no pain in the above-mentioned area.

Discussion

The objective of the study was to present a proposal for a physiotherapeutic procedure in a patient after surgical treatment of endometriosis. Women struggling with endometriosis are very often exposed to chronic pain. This pain can worsen during menstruation, intercourse, or even during urination or defecation. Methods used in alleviating its severity include, among others, the use of hormone therapy, physiotherapy, diet therapy or even psychotherapy [20, 21]. In advanced cases, where the degree of dissemination of endometriotic lesions is too extensive, surgical removal is recommended. Physiotherapy plays a key role after surgery [22]. During physiotherapy after surgery, the patient should be educated, taking into account the correct performance of everyday activities, e.g. correct standing up after surgery or appropriate toilet habits [23]. When starting the process of physiotherapy in a patient suffering from endometriosis, it is worth paying attention to the control of the respiratory track. Research shows that the diaphragm, as the main respiratory muscle, influences the positioning and functioning of the internal organs of the abdominal cavity by contracting and relaxing [24, 25, 26]. Each surgical procedure is associated with the formation of a scar. Scars can be small in size, such as after laparoscopy, or larger in size, such as after laparotomy. Works on improving the scar quality allows for an increase in its mobility in relation to the surrounding tissues and makes it more flexible [27, 28]. Another important aspect in physiotherapy is the assessment of the spine, pelvis and myofascial structures. During the examination, the symmetry of bone structures and the tension of periarticular tissues are assessed [29]. It is important that the patient's engagement does not end with a physiotherapeutic appointment. The patient should be advised to exercise at home and informed about the proper course of exercise.

We showed the presence of trigger points in the rectus abdominis muscles, which is consistent with the research

conducted by Jarell J., in which the author showed a correlation of the presence of trigger points in the abdominal muscles in women with endometriosis with chronic pelvic pain and myofascial dysfunctions [30].

Research conducted by Stratton P. has documented the presence of trigger points in the area of the abdominal and pelvic muscles in women suffering from endometriosis and chronic pelvic pain [31].

In his research, Hunt J. described the physiotherapeutic procedure after laparoscopic removal of endometriotic foci, involving, among others, myofascial relaxation of the abdominal, ilio-lumbar, piriformis and gluteal muscles, and scar mobilization, which resulted in the reduction of pain experienced by the patient [32].

The massage used in patients with menstrual pain caused by endometriosis reduced the pain experienced during menstruation as shown in the research conducted by Valiani M. In the research, massage techniques were used in the area of the abdomen, lateral side of the trunk and sacrum. Finally, pain intensity was assessed before treatment, immediately after treatment, and six weeks after its completion. A significant reduction in menstrual pain in this group was demonstrated [33].

Based on the assessment of the Endometriosis Impact Questionnaire (EIQ), reduction of pain during menstruation as well as pelvic pain between periods was demonstrated. The patient reported less fatigue and improved sleep quality. Before therapy, the patient rated the physical side effects after surgical procedures at 4 on the Likert scale, and after therapy at 0. However, the patient continues to consider hysterectomy in the future for fear of future suffering that may result from the unpredictable nature of the disease. In terms of mental health, the patient reported an improvement in the frequency of mood swings, accompanying state of depression, and anxiety related to the amount of pain medications she was taking. In the sphere of sexual life, pain during sexual intercourse has been reduced.

The performed therapy improved the scar quality on the Manchester Scar Scale. Before therapy, the colour of the scar was clearly different from that of the surrounding skin. The scar tissue was red and shiny, and its superficial structure was hard. After therapy, it was noticed that the scar was light and matt, not much different from the surrounding skin. A significant difference was noted in the scar pain intensity. Before therapy, the pain oscillated around 3-4 points on the VAS scale, increasing to 5-6 points before menstruation. When defining scar pain after therapy, the patient rated it as 0 in everyday functioning, while in the perimenstrual period as reaching 2-3 points on the VAS scale. The final effect was assessed as good, due to the aesthetic appearance of the scar and the reduction of pain, which improved the patient's well-being and quality of life. The unsatisfactory effect is related to the contour of the scar, which has not improved. Perhaps the limiting factor was the late commencement of therapy or permanent scarring damage to the connective tissue, which could make therapy even more difficult. The unsatisfactory result of working with the scar is also caused by pain in the perimenstrual period in its area, which has not been completely eliminated. It may be

caused by adhesions resulting from surgery inside the pelvis, which in the perimenstrual period increase the tension of smooth muscles and the neuromuscular network in a hormone-dependent mechanism.

The assessment of the effectiveness of diaphragm therapy can only be based on the subjective perception of the examiner and the patient, due to the lack of existing scales to assess the functioning of the diaphragm. Examination before therapy showed greater tension and tenderness of the diaphragm on the left side, which could result, for example, from incorrect posture of the patient after surgery or from stress. After therapy, tension and tenderness decreased.

Manual ischemic compression of the rectus abdominis and ilio-lumbar trigger points reduced the severity of pain in their area. However, in the peri-menstrual period, tenderness in these areas increased slightly.

Literature provides information on the causes of pelvic pain, such as myofascial disorders, including of iliopsoas and abdominal muscles. The iliopsoas muscles can cause transferred pain occurring in the buttocks area, the front of the thighs, groin and lower abdomen, while the abdominal muscles in the xiphoid process area, sacroiliac joints or the lumbar spine [34, 35]. In manual therapy, among others, ischemic compression of trigger points or massage are used, which reduce tension and alleviate pain [36]. Massage is recommended in the treatment of scar tissue to improve its quality [27, 28]. From the reports of other researchers it can be concluded that physiotherapy relieves pain and reduces excessive muscle tension in patients with endometriosis [37].

The results of this study confirm that physiotherapy should constitute an integral part of comprehensive treatment of patients suffering from endometriosis.

Conclusions

1. Physiotherapeutic procedures after surgical removal of endometriotic lesions may constitute an important part of comprehensive treatment. However, more research in this field is needed.
2. The applied therapy reduced the patient's pain and improved the patient's quality of life.

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