The assessment of quality of life and satisfaction with life of patients before and after surgery of an isolated apical defect using synthetic materials

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Abstract

Background Pelvic floor static disorders constitute a significant clinical and social problem. The incidence of the problem increases with the age of female patients up to 80 years of age. Due to various methods of procedural treatment, eligibility for surgery should be carefully discussed with the patient. Ideally, the surgery should be effective, applicable in patients with a positive family history and with the least possible number of complications. Such procedures seemed to be transvaginal surgeries performed under block anaesthesia, using synthetic materials, giving good results in most studies. The objective of this study was to assess the quality of life of patients before and after the surgery of an isolated apical defect with the use of synthetic materials.

Methods The study included 60 patients who were diagnosed with pelvic floor static disorder on the basis of physical examination. Standardised questionnaires were used to assess the quality of life and satisfaction with life: the Perceived Quality of Life (P-QOL) and the Satisfaction With Life Scale (SWLS).

Results The P-QOL results for each domain were higher in patients before surgery compared to the results obtained after the surgery. For almost all domains, the results obtained were statistically significant. The results of the SWLS questionnaire in most answers also show that after the procedure there was an improvement in satisfaction with life in the examined female patients.

Conclusion In most patients, surgical treatment of an isolated apical defect using synthetic materials results in clearance of burdensome symptoms and improves the quality of life.

1. Background

Pelvic floor static disorder constitutes a significant clinical and social problem. The
symptoms worsen when intra-abdominal pressure increases, for instance during physical activity or coughing. The number of patients with pelvic organ prolapse is not exactly known due to different definitions of the disorder and various systems of classification. According to the latest European data, the problem concerns approximately 6-11% of women. According to American data, the disorder is found in about 24% of women. The incidence of the problem increases with the age of female patients up to 80 years of age. In such cases, the need to perform surgery is determined in 20% of women [1, 2, 3].

1.1. Surgical treatment

Currently, the basic indication for surgical treatment is the occurrence of symptoms and the lack of consent of the patient for conservative treatment. The most common symptoms are:

- strain and/or pain in the lower abdomen;
- urinary and/or faecal incontinence;
- recurrent bladder ailments (urinary urgency or pollakiuria);
- difficulty urinating and/or defecating;
- the need to change body position in order to urinate;
- limited sexual activity [4].

Due to various methods of procedural treatment, eligibility for surgery should be carefully discussed with the patient. Ideally, the surgery should be effective, applicable in patients with a positive family history and with the least possible number of complications.

In 1990, A. Wattiez [5] performed the first laparoscopic sacrocolpopexy, which is a gold standard for treating pelvic floor static disorders. The surgery involves the reconstruction of pelvic fascia using an implant. The Y-shaped back mesh is attached to the puborectalis and above, to the vaginal stump or the uterine cervix, while the front mesh is affixed below the vesical trigone. Both mesh implants are joined and after opening the peritoneum they are stitched to the longitudinal ligament of the vertebral column. Then, the peritoneum is closed over the mesh [6].
The surgery gives very good treatment results in the absence of complications typical for vaginal mesh implants. Unfortunately, due to the fact that the patient is in the Trendelenburg position during surgery and on account of the long surgery time of approximately 180 minutes [7], laparoscopic sacrocolpopexy is not a solution that can be performed on every patient.

Therefore, new solutions have appeared, such as Noe's [8] pectopexy (the suspension of the Cooper's ligament) and the Dubuisson's laparoscopic lateral suspension [9].

However, it seems that in case of history of internal diseases, older patients for whom laparoscopic or abdominal surgeries under general anaesthesia may pose too high risks, the only alternative is transvaginal surgery. Then, the vaginal suspension to the sacrospinous ligament, developed by Amreich in 1951 [10], and then modified by Sederl and Richter, [11] should be considered. This method involves putting stitches on the sacrospinous ligaments after it becomes visualised. According to the latest scientific reports, this method is less effective than sacroplaxia. Moreover, frequent recurrences after surgery and rather common problems with ligament visualisation [12] made it necessary to introduce a method which would combine low invasiveness of transvaginal surgery with high efficiency.

Transvaginal surgeries performed under block anaesthesia, with the use of synthetic materials, giving good results in most studies [13], seemed to be a good solution. However, due to the possibility of complications, such as mesh erosion and pain associated with its implantation, in 2011, the U.S. Food and Drug Administration (FDA) issued a warning, and in 2019 withdrew the vaginal mesh implants from the US market [14].

Complications related to the use of the mesh include the possibility of its erosion, which can be avoided by using small mesh implants with a monoporous texture that reduce the
burden of biomaterials. Due to the preparation and attachment of the mesh near the pudendal nerve and pudendal vessels, the possibility of damage to the above structures, including neuralgia or haemorrhage may arise [15].

Despite the uncertainties presented above concerning the performance of the surgery of an isolated apical defect using synthetic materials, it seems that the procedure is justified, especially in elderly patients, who have a history of internal diseases.

According to available data, 11% of women over the age of 65 have sexual intercourse. Moreover, about 52% of seniors would like to engage in sexual intercourse at least once a week or every day, but only 40% have had sexual intercourse once during the last year [16]. This is caused by physiological and psychosocial, but also medical factors. It is worth mentioning that reconstructive treatment with polypropylene mesh implantation allows the patients to have sexual intercourse, as opposed to, for instance, the Neugebauer-Le Fort method, which involves partial or complete closure of the vagina. The greatest advantages of surgeries using synthetic mesh implants include the possibility of using them in patients with history of internal diseases due to the use of block anaesthesia or, in case of specific anaesthetic contraindications, short intravenous or infiltration anaesthesia. Another advantage is the procedure time, which is about 30 minutes, and short hospitalisation time, allowing patients to leave the hospital as early as 24 hours after surgery [17].

1.2. Quality of life of patients with pelvic floor static disorders

The problem, which greatly decreases the quality of life of patients with pelvic floor static disorders, are symptoms of micturition disorder [18]. They mainly include incomplete bladder voiding, chronic urine retention, interrupted or impeded urination, as well as the need to support urination by engaging the abdominal prelum or the need to change body position in order to urinate. Some patients with complete uterine prolapse must manually
relocate the prolapsed reproductive organ to urinate. Pelvic floor static disorders significantly impede basic life activities such as walking. It is also not uncommon for painful abrasions, bedsores and hernial sac ulcers to appear. However, there are still no scientific reports assessing the efficacy of the method, particularly in terms of improving the quality of life of patients undergoing the procedure [19].

Currently, in the process of treatment, in addition to achieving medical goals, the non-medical ones, which include improving the patient's well-being and quality of life, play an important role. Indeed, it is the assessment of quality of life that proves the holistic approach to the patient and their problem [20]. When assessing quality of life, two aspects must be taken into account: the subjective and the objective one. Subjective assessment of the quality of life is primarily based on an interview. Unfortunately, such assessment will depend on the patient's mental state, her preferences, value system and personality traits. Objective assessment of quality of life is most frequently carried out by means of standardised questionnaires. Questionnaires are a valuable and repeatable tool for measuring the quality of life of patients [21, 22].

According to the World Health Organisation Quality of Life (WHOQOL), quality of life means an individual's perception of their position in life in the context of the culture and value systems in which they live. The quality of life is primarily influenced by physical health, interpersonal contacts and environmental characteristics [23, 24]. Nowadays, doctors not only focus on extending the life of their patients, but also on improving its quality. Contemporary medicine aims to improve the quality of life of the patient to the condition from before the disease. Therefore, researchers are increasingly interested in assessing quality of life of people affected by various diseases [25, 26].

The objective of this study was to assess quality of life of patients before and after performing the surgery of an isolated apical defect using synthetic materials.
2. Material And Methods

2.1. Design and data collection

The study involved 60 patients from the Gynaecology Department of the Hospital of the Ministry of Internal Affairs and Administration in Wrocław, who were diagnosed with pelvic floor static disorders. The POP-Q scale and the modified classification of pelvic static disorders according to DeLancey were used to objectively assess the type and degree of the disorder (Table 1).

Table 1. Stages of POP-Q system measurement

| Stage   | Description                                                                 |
|---------|-----------------------------------------------------------------------------|
| Stage 0 | no prolapse is demonstrated                                                  |
| Stage 1 | the most distal portion of the prolapse is more than 1 cm above the level of the hymen |
| Stage 2 | the most distal portion of the prolapse is 1 cm or less proximal or distal to the hymenal plane |
| Stage 3 | the most distal portion of the prolapse protrudes more than 1 cm below the hymen but no farther than than the total vaginal length (for example, not all of the vagina has prolapsed). |
| Stage 4 | vaginal eversion is essentially complete                                      |

[Persu C, Chapple CR, Cauni V. Pelvic Organ Prolapse Quantification System (POP-Q) – a new era in pelvic prolapse staging. J Med Life. 2011; 15 4(1): 79.]

All patients qualified for the study had an isolated apical defect POP-Q III C or POP-Q IV C.

Before starting the project, informed consent was obtained from all of the patients to participate in the study. All qualified patients completed the P-QOL and the SWLS questionnaires twice: before and 12 months after surgery. Patients were qualified for the study on the basis of specific inclusion criteria.

The inclusion criteria were:

Patients with an isolated apical defect;
Reproductive organ static disorder grade III or IV of the POP-Q scale;
Level I defect on the modified DeLancey scale
Lack of consent to pessary treatment
Age over 65
All patients qualified for the project had a cervical or vaginal stump suspension procedure performed using the AMI BSC system.

2.2. Measures

1. *The Perceived Quality of Life* (P-QOL) questionnaire is a generic instrument for assessing perceived QoL and the level of satisfaction with life. The questionnaire consists of 38 questions, of which the first twenty represent nine QoL domains (general health perception, prolapse impact, role limitations, physical limitations, social limitations, personal relationships, emotions, sleep/energy, and symptom severity measures). The next eighteen questions refer to the symptoms of pelvic organ prolapse. The responses range from ‘none/not at all’ through ‘slightly/a little’ and ‘moderately’ to ‘a lot’. A four-point scoring system for each item was used to measure the severity of the urogenital prolapse symptoms. No combined score is calculated for this questionnaire. If a woman has only one affected life domain and another woman has another affected domain, they are both considered symptomatic, though in different aspects of QoL [27,28].

2. *The Satisfaction With Life Scale* (SWLS) questionnaire was developed by Diener et al., and a Polish adaptation was made by Juszczyński [29]. It is a tool used to analyse the satisfaction of the respondents with their current life. The questionnaire consists of 5 questions assessed on a 7-point scale. Values from 1 for "I strongly disagree" to 7 for "I strongly agree" were assigned to the answers to individual questions. The higher the score (min. 5 points, max. 35 points), the greater the feeling of satisfaction with life [30].

3. **Statistical analysis**

The statistical analysis was carried out using the R programme. Descriptive statistics were used to analyse the results obtained. The quality of life of patients from before and 12
months after surgery was compared using the following tests: Wilcoxon matched-pairs test or the Fisher’s exact test. The analysis was carried out both for the results obtained from the P-QOL and the SWLS questionnaires. Value of p <0.05 was regarded as statistically significant.

4. Results

60 women with diagnosed POP-Q III C and IV C were qualified for the project. The average age of the patients was 70.28 years (range 65–87 years old). The P-QOL results for each domain were higher (i.e. worse) in patients before surgery compared to the results obtained after surgery. For almost all domains, the results obtained were statistically significant (Table 2). Most of the answers given in the P-QOL questionnaire, which concerned urinary tract and bladder symptoms, were also statistically significant as the quality of life in their functioning after surgery has significantly improved (Tables 3 and 4). After the surgery, statistically significant changes in other symptoms assessed in the P-QOL questionnaire were also observed (Table 5).

**Table 2**

Domain scores of the PQoL questionnaire from women before and after surgery

| Domain                | before surgery | after surgery | p-value     |
|-----------------------|----------------|---------------|-------------|
| General Health        |                |               |             |
| n = 60                |                |               |             |
| before surgery        | 40 (0–80)      | 20 (0–80)     | 0.00002861  |
| after surgery         | 38.60 (17.67)  | 26.67 (17.86) |             |
| p-value               |                |               |             |
| Prolapse Impact       |                |               |             |
| n = 60                |                |               |             |
| before surgery        | 50 (0–75)      | 0 (0–75)      | 0.000007581 |
| after surgery         | 38.60 (29.15)  | 18.86 (27.66) |             |
| p-value               |                |               |             |
| Role Limitation       |                |               |             |
| n = 60                |                |               |             |
| before surgery        | 12.50 (0–75)   | 0 (0–75)      | 0.0001724   |
| after surgery         | 26.96 (30.60)  | 10.75 (23.79) |             |
| p-value               |                |               |             |
| Physical Limitation   |                |               |             |
| n = 60                |                |               |             |
| before surgery        | 0 (0–75)       | 0 (0–75)      | 0.0001927   |
| after surgery         | 27.19 (30.26)  | 10.31 (21.54) |             |
| p-value               |                |               |             |
| Social Limitation     |                |               |             |
| n = 60                |                |               |             |
| before surgery        | 19.30 (25.12)  | 0 (0–50)      | 0.0002904   |
| after surgery         | 17.53 (24.51)  | 7.31 (16.37)  |             |
| p-value               |                |               |             |
| Personal Relationship |                |               |             |
| n = 60                |                |               |             |
| before surgery        | 0 (0–72.73)    | 0 (0–54.55)   | 0.01551     |
| after surgery         | 17.53 (24.51)  | 7.31 (13.48)  |             |
| p-value               |                |               |             |
| Emotion               |                |               |             |
| n = 60                |                |               |             |
| before surgery        | 13.33 (0–73.33)| 0 (0–73.33)   | 0.0002301   |
| after surgery         | 19.42 (22.51)  | 9.47 (16.81)  |             |

Data are presented as median (range) and mean (standard deviation). n denotes size of each group. Given p-values are for the Wilcoxon test for dependent samples.
Table 3
Urinary symptom responses from PQoL questionnaire from women before and after surgery

| Urinary Symptom                                      | Response                          | Before Surgery | After Surgery | P-value       |
|------------------------------------------------------|-----------------------------------|----------------|---------------|---------------|
| Frequent visits to the toilet to urinate             | does not occur not at all a little moderately a lot | 6 6 10 31 7   | 25 11 9 11 4 | 0.0004818     |
| Sudden, very strong urge to urinate                 | does not occur not at all a little moderately a lot | 7 3 16 22 12 | 27 4 15 10 4 | 0.001219     |
| Urinary incontinence associated with a strong need to urinate | does not occur not at all a little moderately a lot | 14 2 15 13 16 | 31 2 10 10 7 | 0.01085     |
| Urinary incontinence associated with coughing       | does not occur not at all a little moderately a lot | 18 3 13 12 14 | 31 3 10 10 7 | 0.1474     |
| Weak urine flow                                      | does not occur not at all a little moderately a lot | 18 11 18 8 5 | 39 6 8 4 4 | 0.002271     |
| Strain when emptying the bladder                    | does not occur not at all a little moderately a lot | 28 10 9 10 3 | 46 4 4 5 1 | 0.01501     |
| Dripping urine after emptying the bladder           | does not occur not at all a little moderately a lot | 23 9 12 12 4 | 38 9 7 10 2 | 0.05322     |

Data are presented as subgroups size. Given p-values are for the Fisher’s exact test.

Table 4
Bowel symptom responses from PQoL questionnaire from women before and after surgery

| Bowel Symptom                                      | Response                          | Before Surgery | After Surgery | P-value   |
|----------------------------------------------------|-----------------------------------|----------------|---------------|-----------|
| Feeling of incomplete bowel emptying after defecation | does not occur not at all a little moderately a lot | 28 10 7 4 | 39 3 10 5 3 | 0.176     |
| Constipation, difficulty in defecation              | does not occur not at all a little moderately a lot | 32 10 6 7 | 41 6 4 6 4 | 0.4012    |
| Strain accompanying the defecation                  | does not occur not at all a little moderately a lot | 31 13 6 4 6 | 41 9 3 3 4 | 0.4488    |
| Use of fingers to defecate                          | does not occur not at all a little moderately a lot | 48 6 2 1 3 | 53 0 5 0 2 | 0.04262 |
| Frequency of defecation                             | more than once a day once a day once every two days once every three days once a week or less | 8 39 6 4 3 | 4 42 8 4 2 | 0.7779 |

Data are presented as subgroups size. Given p-values are for the Fisher’s exact test.
Table 5
Other symptom responses from PQoL questionnaire from women before and after surgery

| symptom                                      | response                        | before surgery | after surgery | p-value |
|-----------------------------------------------|---------------------------------|----------------|---------------|---------|
| vaginal bulge disturbing in intercourse       | does not occur                  | 29             | 48            | 0.001898|
|                                               | not at all                      | 16             | 7             |
|                                               | a little                        | 4              | 3             |
|                                               | moderately                     | 7              | 0             |
|                                               | a lot                           | 4              | 2             |
| back pain occurring together with discomfort  | does not occur                  | 36             | 49            | 0.03176 |
| in the vagina                                 | not at all                      | 6              | 2             |
|                                               | a little                        | 6              | 6             |
|                                               | moderately                     | 5              | 7             |
|                                               | a lot                           | 9              | 1             |
| vaginal discomfort                             | does not occur                  | 26             | 44            | 0.007846|
|                                               | not at all                      | 6              | 5             |
|                                               | a little                        | 13             | 7             |
|                                               | moderately                     | 6              | 1             |
|                                               | a lot                           | 9              | 3             |
| bulge in a vagina                              | does not occur                  | 33             | 48            | 0.03191 |
|                                               | not at all                      | 4              | 3             |
|                                               | a little                        | 11             | 3             |
|                                               | moderately                     | 5              | 3             |
|                                               | a lot                           | 7              | 1             |
| heaviness or pressure in the vagina or down   | does not occur                  | 32             | 48            | 0.03223 |
| stomach at the end of the day                 | not at all                      | 2              | 1             |
|                                               | a little                        | 10             | 4             |
|                                               | moderately                     | 10             | 5             |
|                                               | a lot                           | 6              | 2             |
| thickening in the vagina making defecate      | does not occur                  | 38             | 51            | 0.01145 |
| difficult                                     | not at all                      | 7              | 3             |
|                                               | a little                        | 11             | 3             |
|                                               | moderately                     | 10             | 3             |
|                                               | a lot                           | 4              | 2             |

Data are presented as subgroups size. Given p-values are for the Fisher's exact test.

The results obtained from the SWLS questionnaire show that after the surgery, patients' satisfaction with life increased (Table 6). The results did not obtain statistical significance, no less visible is the upward trend in the assessed aspect. Table 6 presents the results of individual questions in the questionnaire, including the number of people who provided the answer. No statistical significance was obtained for these data. Despite this, especially in questions number 3 and number 4 it is noticeable that after the surgery patients more often indicated that they were happier and could fulfill their life goals (Table 7).

Table 6
Domain scores of the SWLS questionnaire from women before and after surgery

|                              | before surgery | after surgery | p-value |
|------------------------------|----------------|---------------|---------|
| total score                  | 23.5 (5–35)    | 30 (8–35)     | 0.5044  |
| n = 60                       | 22.92 (6.58)   | 23.72 (6.81)  |         |

Data are presented as median (range) and mean (standard deviation). n denotes size of each group. Given p-value is for the Wilcoxon test for dependent samples.
Table 7
Responses from SWLS questionnaire from women before and after surgery

| question                                      | response                          | before surgery | after surgery | p-value  |
|-----------------------------------------------|-----------------------------------|----------------|---------------|----------|
| In most aspects my life is close to my ideal  | I definitely agree                | 7              | 8             | 0.9279   |
|                                               | I agree                           | 8              | 11            |          |
|                                               | I rather agree                    | 19             | 14            |          |
|                                               | I neither agree nor I disagree    | 11             | 13            |          |
|                                               | I disagree                        | 3              | 3             |          |
|                                               | I rather disagree                 | 6              | 4             |          |
|                                               | I definitely disagree             | 6              | 7             |          |
| The conditions of my life are perfect        | I definitely agree                | 9              | 11            | 0.9889   |
|                                               | I agree                           | 13             | 12            |          |
|                                               | I rather agree                    | 13             | 15            |          |
|                                               | I neither agree nor I disagree    | 11             | 11            |          |
|                                               | I disagree                        | 7              | 9             |          |
|                                               | I rather disagree                 | 2              | 5             |          |
|                                               | I definitely disagree             | 2              | 1             |          |
| I am happy with my life                       | I definitely agree                | 8              | 9             | 0.8119   |
|                                               | I agree                           | 15             | 19            |          |
|                                               | I rather agree                    | 11             | 18            |          |
|                                               | I neither agree nor I disagree    | 2              | 2             |          |
|                                               | I disagree                        | 4              | 4             |          |
| So far, I achieve important goals that I want in my life | I definitely agree                | 5              | 9             | 0.8794   |
|                                               | I agree                           | 16             | 19            |          |
|                                               | I rather agree                    | 13             | 16            |          |
|                                               | I neither agree nor I disagree    | 3              | 13            |          |
|                                               | I disagree                        | 14             | 13            |          |
|                                               | I rather disagree                 | 18             | 13            |          |
|                                               | I definitely disagree             | 1              | 7             |          |
| If I could live my life again, I would change almost nothing | I definitely agree                | 11             | 12            | 0.4445   |
|                                               | I agree                           | 14             | 13            |          |
|                                               | I rather agree                    | 10             | 6             |          |
|                                               | I neither agree nor I disagree    | 5              | 6             |          |
|                                               | I disagree                        | 3              | 9             |          |
|                                               | I rather disagree                 | 11             | 9             |          |
|                                               | I definitely disagree             | 6              | 8             |          |

Data are presented as subgroups size. Given p-values are for the Fisher’s exact test.

5. Discussion

The main aim of this study was to assess the quality of life in patients before and after surgery of an isolated apical defect. The results showed that after the surgery the quality of life of the patients improved significantly, as in most cases the symptoms which significantly limited the daily functioning of the affected women disappeared. Ellerkmann et al. [31], in the conducted study, observed the correlation between anterior wall prolapse and urinary incontinence as well as improved quality of life of patients after surgery. Clemons et al. [32], in their study, assessed the level of satisfaction and the changes in the degree of prolapse and the symptoms of urinary incontinence in patients...
with pelvic floor static disorders. All patients received a 2-month conservative treatment with the use of pessaries. After the end of the therapy, an improvement in the quality of life and the disappearance of the prolapse symptoms were observed in 92% of the patients. Also, Killinger et al. [33], on the basis of 6 questionnaires, assessed the changes in the quality of life in patients with pelvic floor muscle disorders who underwent one-year conservative treatment in the form of pelvic floor muscle training. Most women showed improvement of symptoms measured by means of questionnaires.

Mirskaya et al. [34] conducted an online interview with patients after natural labour during which pelvic floor static disorder occurred. 33 women of childbearing age were qualified for their study. The results presented by the authors showed that, as a result of this event, the mental and physical lives of the patients were ruined. Due to prolapse, the patients had to give up many daily activities, sex life, sports and even some parental responsibilities. Riss et al. [35] demonstrated that pelvic floor static disorder has a worse effect on the quality of life than stress urinary incontinence. Matanes et al. [36, 37], in their studies, compared the efficacy of surgeries using mesh implants, which were performed by a surgeon or with the assistance of a robot. On the basis of several questionnaires, the change in the quality of life and sexual function of the patients in particular groups was assessed. The assessment was performed 6 weeks and 6 months after the procedure. The quality of life parameters in both groups have improved at a similar level.

Rahkola-Soisalo et al. [38] have also studied the role of the influence of the isolated apical defect surgery on the quality of life of the patients. 207 patients were qualified for their study, and they had an isolated apical defect procedure performed using the Vaginal Uphold™ system. 12 months after the procedure, they assessed the quality of life and sexual function of the patients using three standardised questionnaires. On the basis of
the results obtained, the authors concluded that the quality of life of the patients has significantly improved, while the sexual function has deteriorated after the surgery. Hüsch et al. [39] assessed the quality of life in patients after transvaginal pelvic floor static disorder surgery using mesh implants. The results obtained were compared with those of patients who did not show any symptoms of pelvic floor static disorder and who were in the same age group. A low complication rate as well as quality of life at a comparable level between patients undergoing the procedure and healthy women were found. Similar conclusions were reached by Fünfgeld C et al. [40], who assessed the efficacy of the procedure 12 and 36 months after performing the alloplastic mesh implantation. In their work, the authors focused more on functional assessment and anatomical repair of the defect. Quality of life assessment was an additional element. Both this study and those cited above show the importance of assessing the quality of life in patients with pelvic floor static disorders. Effective surgical treatment not only eliminates the anatomical defect, but also improves the mental health of the patients. The presented results show that healthcare workers should assess and attempt to improve the quality of life of the patients. It therefore appears necessary to carry out further research to develop a preventive strategy and to accelerate the diagnosis and treatment of factors affecting the quality of life and satisfaction with life of patients with pelvic floor static disorders.

6. Conclusion

1. Surgical treatment of an isolated apical defect using synthetic materials causes in most patients the regression of burdensome symptoms and improves their comfort of life.

2. The P-QOL and the SWLS questionnaires constitute useful tools to assess the effect of treatment and help patients to become aware of the improvement in their quality of
life after surgery.

3. Transvaginal surgery using systems with non-absorbable materials, despite controversy associated with the number of complications and erosions, seems to be a reasonable alternative to laparoscopic surgery in a strictly selected group of patients with apical defect.

Abbreviations

P-QOL Perceived Quality of Life
SWLS Satisfaction With Life Scale
FDA Food and Drug Administration
WHOQOL World Health Organisation Quality of Life
POP-Q Pelvic Organ Prolapse Quantification System

Declarations

Ethics approval and consent to participate

The research was approved by the Bioethics Committee of the Medical University in Wroclaw. Before participating in the research, each participant signed a consent to participate in the project.

Consent for publication

Not applicable.

Availability of data and materials

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.
Competing interests

All authors declare that they have no competing interests.

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Authors’ contributions

MZ, GK, KN and WA performed the development of study design, and the original literature search, and participated in drafting the manuscript. ŁB and AM participated in the design of the study and performed the statistical analysis. MZ, GK, AM, KN, ŁB and WA participated in Data acquisition and analysis. All authors read and approved the final manuscript.

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