

The use of panniculectomy in morbidly obese patients undergoing gynecological surgery

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Submitted: 2013-10-25 *Accepted:* 2014-02-03 *Published online:* 2014-05-05

Key words: **obesity; panniculectomy; endometrial cancer; uterine myoma; laparoscopy**

Neuroendocrinol Lett 2014; **35**(2):98–103 PMID: 24878982 NEL350214C02 © 2014 Neuroendocrinology Letters • www.nel.edu

Abstract

Panniculectomy is a surgical procedure that involves removal of the skin and fat excess which facilitates access to the peritoneal cavity. In the paper we present three cases of morbidly obese women (BMI: 46.3–59.5) who were treated in the Department of Gynecology and Oncological Gynecology in Lodz. One of the patients underwent an operation due to the presence of a large cervical myoma. Two another women were treated for endometrial cancer. During all of the three procedures panniculectomy was the first stage of the operation.

Abbreviations:

BMI - Body Mass Index
CT - computer tomography
PMMHRI - Research Institute of Polish Mother's Memorial
TV USG - transvaginal ultrasonography
WHO - World Health Organization

INTRODUCTION

Obesity is a common entity in developed, as well as in developing countries. Obesity is a condition in which excess of body fat is more than 20% of the total body mass in men and 25% in women (WHO 2013). Both hereditary factors and living conditions (for instance: growth of income, the decline of physical activity, stressful work) contribute to the fact that, nowadays, obesity is becoming more frequent entity among patients. According

to the World Health Organization (WHO 2004) in 2008 about 35% of adults over the age of 20 were overweight. 10% of men and 14% of women were obese. In comparison, in 1980, these percentages were at the level of 5% for men and 8% for women. It is estimated that 205 million of men and 297 million of women in the whole world are obese. Body mass index (BMI) is most commonly used to assess the degree of excessive fat tissue of the body. Among adults, BMI above 25 indicates being overweight, whereas more than 30 suggests obesity (WHO 2006).

Excess of fat tissue may lead to the development of insulin resistance, impaired glucose tolerance, dyslipidemia, hypertension, activation of inflammatory and prothrombotic processes and as a result to heart failure, stroke or osteoarticular diseases. These changes are connected with a meta-

bolic syndrome, with a rising prevalence among adults. However, recently the entity has become more common in the group of younger patients (Kęska *et al.* 2012). Obesity is also a risk factor for endometrial cancer (Crosbie *et al.* 2010). According to the European data it is estimated that about 60% of new cases of endometrial cancer coexists with obesity (Renehan *et al.* 2009). Moreover, obesity is also a negative prognostic factor. In obese women with BMI >40 the risk of death from endometrial cancer is more than six times higher than in women with normal BMI (Calle *et al.* 2003).

The primary treatment of endometrial cancer is surgery consisting of removal of the uterus, adnexa and pelvic lymph nodes. These are extensive procedures requiring a precise overview of the operative field. Surgical treatment of severely obese patients is a major challenge for gynecologists, mainly because of the difficult access to the pelvic cavity. In addition, these procedures are encumbered with worse postoperative wound healing and increased postoperative morbidity (Pavelka *et al.* 2004). Similar situation occurs in case of other gynecological pathologies. A sufficient view of the operative field is necessary in cases of very large uterine fibroids, especially if they are hard to reach. An effective access to the peritoneal cavity should be obtained when fibroids are located in the cervix or between the plates of the broad ligament of the uterus. Fibroids may lead to symptoms of compression (compression of nerves, blood vessels or ureter), therefore, an extensive surgical approach is required (Wallach & Vlahos 2004).

One way to facilitate the procedure in severely obese patients, which provides a sufficient access to the pelvic organs, is panniculectomy. This procedure was first described in 1910 (Kelly 1910). It involves a removal of a skin lobe together with the excessive fatty tissue from the abdominal wall. This procedure is performed mainly in patients who had been severely obese and then lost weight after bariatric operations. In such cases, excess of stretched skin and subcutaneous tissue remains on the abdomen (Igwe *et al.* 2000). Recently, panniculectomy has also been used as an additional procedure allowing better access during surgical procedures performed due to gynecological pathologies.

Igwe *et al.* (2000) proposed a 5-point scale describing patient's obesity (Table 1). Patients who reach the point of 2–5 on the scale can be offered a surgical treatment such as panniculectomy.

Tab. 1. Grading of the panniculus.

Stage	Description
1	Excess of fat tissue reaches the border of pubic hair
2	Excess of fat tissue reaches the pubic symphysis
3	Excess of fat tissue reaches the thigh
4	Excess of fat tissue reaches the center of the thigh
5	Excess of fat tissue reaches the knees or below

The most common complications of panniculectomy are: high blood loss which may necessitate transfusions, pulmonary embolism, dehiscence and wound infection, formation of hematoma in the wound.

We present three cases of panniculectomy in patients hospitalized and operated in the Department of Gynecology and Oncological Gynecology, Polish Mother's Memorial Hospital Research Institute in Lodz (PMMHRI). Two patients underwent surgery due to endometrial cancer. Because of the extreme obesity and cardiovascular diseases they were disqualified from exclusive chemo- and radio-therapy. Surgery, despite the high risk, was the only possible treatment in both patients. One patient was operated because of the chronic vaginal bleeding. Results of the pelvic examination and diagnostic tests – transvaginal ultrasonography (TV USG) and computed tomography (CT) – allowed us to determine that the cause of the vaginal bleeding was a large cervical fibroid.

CASE 1

A patient, aged 57, admitted to the Department of Gynecology and Oncological Gynecology, PMMHRI in Lodz due to the presence of uterine endometrial cancer (grade – G3).

Menarche occurred at 13 years of age. Until menopause, menstruations were regular, every 28 days, lasting up to seven days, but quite profuse. The patient spontaneously miscarried once, gave birth two times, both pregnancies were finished by caesarean section. Last menstrual period was at 52 years of age.

Concomitant diseases, as follows: obesity, hypertension, coronary heart disease, type 2 diabetes (treated with oral anti-diabetics), spinal osteoarthritis, anal fissure (surgery in 2011), urolithiasis, cholelithiasis (surgery in 2002), the history of vein inflammation in the lower limbs. Patient weight was 126 kilograms, height 165 cm, BMI=46.3. After cardiologic consultation patient was prepared for surgery in a typical way.

The first step of the treatment was panniculectomy. A skin-fat fold from the abdominal wall, that weighted 8 kg, was removed. The procedure allowed to obtain an access to the abdominal fascia. Then the abdominal cavity was opened according to Maynard method. Enlarged uterus of a size of about 12 cm was visualized. The left appendages were pathologically changed, probably with presence of metastasis from the uterus. A hysterectomy with bilateral salpingo-oophorectomy was performed in a typical manner. Due to the difficult operative conditions that derived from significant obesity, the removal of pelvic lymph nodes was abandoned. Surgeon's evaluation of the operative field showed that the risk of severe vascular complications was too high. Drains were derived from the peritoneal cavity, as well as from the sub-fascial and subcutaneous tissue. Single sutures were applied to close the skin incision. The operation lasted for 190 minutes. Patient's condition

after the surgery was satisfactory. Prophylactic antibiotics were used intra- and post-operatively.

Blood loss during the procedure was assessed on the basis of hemoglobin level odds before and after surgery (14 mg % before the treatment and 10.7 mg % on the first day after the operation). The patient did not require blood transfusion.

The postoperative course was uneventful. Surgical wound was healing properly. The patient was discharged from the Department six days after the surgery.

Histopathological result showed that it was an endometrial adenocarcinoma of the uterus (grade – G3). There was an evidence of cervix infiltration. Precise histopathological evaluation of the cancer spread was difficult due to the presence of fibroids. In the areas between submucosal fibroids, menopausal endometrium remained. In the other areas poorly differentiated carcinoma, that involved the entire wall of the uterus, was detected. Some nodular formations, that were revealed during the postoperative examination, turned out to be foci of proliferating cancer. Right and left parametrium were extensively infiltrated by the cancer (multiple vascular cancerous deposits were detected). Right appendage did not show any evidence of cancer invasion. Metastatic pathological changes in the left fallopian tube and left ovary were confirmed. The patient was referred to the Oncology Center for adjuvant chemotherapy.

CASE 2

A patient, aged 58, admitted to the Department of Gynecology and Oncological Gynecology, PMMHRI in Lodz due to endometrial cancer, that was diagnosed a month earlier (papillary adenocarcinoma, grade – G2). Obstetrical history revealed two natural labours, no miscarriages. Last menstrual period was at 53 years of age.

A thorough past history was taken that showed coexistence of many general diseases, namely : hypertension, type 2 diabetes (treated with oral anti-diabetics), ischemic heart disease, psoriasis, depression, umbilical hernia, varicose veins of the lower limbs. Patient weight was 144 kilograms, height 160 cm, BMI=54.7. Before the surgery patient underwent a cardiological consultation.

In the first stage of the operation, the excess of skin and fat, weighing 12 kg, was removed. The abdominal cavity was opened according to Pfannenstiel method. The body of the uterus was enlarged with fibroids. Appendages on both sides were unchanged. A hysterectomy with bilateral salpingo-oophorectomy was performed in a typical way. The part of omentum incarcerated in umbilical hernia was resected. The hernia sac was excised and the hernia was eliminated. The pelvic lymph nodes were sampled. Drains were derived from the peritoneal cavity and subcutaneous tissue. Single sutures were applied to close the skin incision. The

patient's condition after the surgery was good. Duration of the surgery was 195 minutes. Antibiotics were used in the postoperative period. The difference of hemoglobin levels before and after surgery was 1.5 g/dl.

The postoperative course was uneventful. Surgical wound healed properly. The patient was discharged from hospital in ninth day after the surgery.

The result of postoperative histopathology showed adenocarcinoma of the uterus (grade – G2). Neoplastic infiltration shallowly penetrated the wall of the uterus and did not exceed half of its thickness. The evaluation of fallopian tubes, parametrium and cervix showed no cancer infiltration. There were no metastases in resected part of omentum, lymph nodes and adnexa.

CASE 3

A 50 years old patient admitted to the Department of Gynecology and Oncological Gynecology, PMMHRI in Lodz due to abnormal vaginal bleeding lasting for several weeks, which was the cause of anemia (hemoglobin 9.6 g/dl).

Obstetrical history revealed one natural labour, no miscarriages. Her last menstrual period was at 48 years of age. Co-morbidities included hypertension. Patient's weight was 160 kilograms, height 164 cm, BMI=59.5.

Result of a clinical evaluation was unreliable due to the high obesity, however, a 15 cm myoma of the uterine cervix was revealed. Ultrasound examination was extremely difficult due to the obesity of the patient. Echoes of the endometrium and appendages were not shown, and a distal part of a giant fibroid of the cervix was visualized. Additionally, CT scans of the abdomen and pelvis were performed. Pelvic evaluation revealed homogeneous, solid mass of dimensions of 163×188×211 mm. The tumor modeled adjacent structures but no obvious features of tissue invasion were present. Just above this pathological abnormality, a structure of the size of 64×51×48 mm was visible. It was suggested that it might have been the uterine corpus. Before the surgery, patient was consulted by a cardiologist and qualified to operation. Figure 1 shows the patient before the surgery.

In the first stage of the operation, the excess of skin and fat, weighing about 7 kilograms was removed (Figure 2). The abdominal cavity was opened according to Pfannenstiel method. A normally sized uterus with a large fibroid of the size of 20 cm was found. It seemed that it originated from the front part of the cervix. The other abdominal organs seemed to be macroscopically intact. Appendages were removed in a typical way. The uterus was cut off from the cervical fibroid. After bilateral ureteral visualization, a fibroid from the pathologically extended (due to the mass of the tumor) cervix was enucleated. Then, the cervix was also removed. The material was sent to histopathological examination. Drains were derived from the peritoneal cavity and subcutaneous tissue. Single sutures were applied to



Fig. 1. Appearance of the patient before surgery

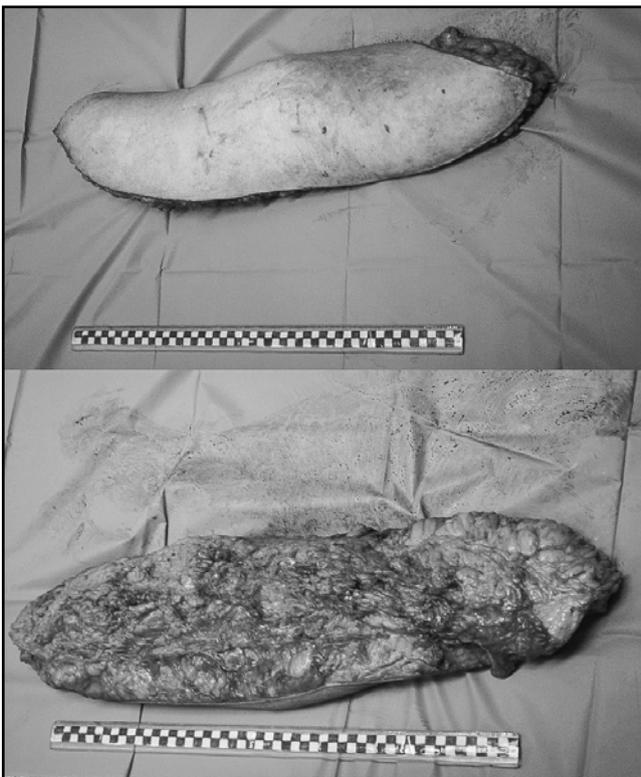


Fig. 2. Removed skin - fat fold



Fig. 3. Appearance of the patient after surgery

close the skin incision (Figure 3). The patient's condition after the surgery was satisfactory. Duration of the procedure was 200 minutes. Antibiotic therapy was applied in the postoperative period. Immediately after the surgery, blood transfusion (two units) was administered. The patient was discharged from the Department eight days after the surgery. On the 12th postoperative day, the patient came back to the ward due to the development of an abscess on the right side of the wound, that measured approximately 6–8 centimeters. Ambulatory treatment was introduced, that was followed by a complete clinical resolution of the abscess.

The result of postoperative histopathological examination showed presence of adenomyosis and fibroids of the uterus.

DISCUSSION

The surgical treatment of cancer and symptomatic uterine fibroids is the method of choice in most patients. The risk of both intra- and post-operative complications is significantly increased in obese women. For gynecologists, operations in obese patients constitute a major challenge. Every case should be carefully analyzed and a plan how to reach the peritoneal cavity should be obtained.

If the access to the surgical field is sufficient, the risk of unwanted complications is highly lowered. Pavelka *et al.* (2004) analyzed medical records of 356 patients operated because of the endometrial cancer. In patients with morbid obesity (BMI >40) it was found that the duration of the procedure was longer, lymphadenectomy was less frequently performed, postoperative complications such as wound infection or dehiscence occurred more frequently in comparison with patients with BMI <30. Wallace and *et al.* (2013) analyzed panniculectomy, that was combined with other surgical procedures, in 15 patients. Limfocoele occurred in 4 cases. Postoperative wound dehiscence occurred in 3 patients, postoperative wound hematoma was found in two patients. In one case there was a wound infection. According to the Wallace *et al.* (2013) study, 13.3% of patients suffered from serious complications and 6.7% from low-grade complications. Shull *et al.* (1988) and Voss *et al.* (1986) studies found an increased risk of major bleeding, resulting in blood transfusions, and pulmonary embolism in obese patients undergoing surgery composed of two procedures: panniculectomy and gynecological surgery. The risk of wound infection in studies of various authors ranges from 2.6% to 33.3% (Cosin *et al.* 1994; Hopkins *et al.* 2000).

Other authors (Kryger *et al.* 2007; Mericli & Drake 2011; Pearl *et al.* 2000), however, state that panniculectomy and abdominoplasty procedures carried out together with other surgical procedures are safe and do not represent a higher risk of health damage. Similarly, patients who underwent surgery in our Department, undergoing at the same time panniculectomy, did not

present serious complications during surgery and in the postoperative period. In the third case, due to the low hemoglobin levels after the surgery, patient required transfusions. This was a result of low blood parameters before the surgery which were worsened by the perioperative blood loss.

In the study of Tilmanns *et al.* (2001) the operating time, when panniculectomy was performed, was only slightly longer in comparison to the control group. These results are different from those presented by Pearl *et al.* (2000) who observed a much longer time of surgery if the panniculectomy was performed.

Lymphadenectomy in women with high risk endometrial cancer is an essential component of clinical staging. According to some authors, it correlates with a better prognosis of recovery and survival (Kilgore *et al.* 1995). Everet and *et al.* (2003) analyzed surgical procedures in 896 women with endometrial cancer. 93.8% patients with BMI <30 underwent lymphadenectomy. In comparison, only in 66.4% of women with BMI >40 lymphadenectomy was performed. In one of our patients lymphadenectomy was abandoned, in case of the other patient, only sampling of iliac lymph nodes was performed. In the first case, difficult operating conditions did not allow for a safe supply of any possible vascular complications.

The alternative to panniculectomy and laparotomy is laparoscopic surgery. Lower tissue trauma, shorter hospitalization stay, better wound healing are well-known advantages of laparoscopy over laparotomy (Majchrzak-Baczmajska *et al.* 2013; Malinowski *et al.* 2013). Obesity is a relative contraindication to laparoscopic procedures, mainly for technical reasons. The limited length of the tools, and a thick layer of subcutaneous tissue make the treatment impossible in severely obese people. Even if alternative sites for the Veress needle and trocars are used it is still very difficult to perform an effective procedure. In the case of endometrial cancer it is not possible to use other sites where the Veress needle could be introduced (namely the posterior vaginal vault or the uterine fundus). Duration of laparoscopic surgery and the need to maintain the Trendelenburg position are serious additional restrictions in the use of laparoscopy in severely obese patients. Nevertheless, the literature describes many cases of laparoscopy performed in severely obese patients. Pellegrino *et al.* (2009) compared the course of laparoscopy performed because of endometrial cancer in the two groups of patients: obese and with normal weight. The study included 37 women with BMI above 30, and 15 patients with BMI over 40. The BMI ranged from 18 to 48. Authors did not demonstrate any statistically significant differences in the course of surgery between these two groups of women. The duration of laparoscopy, the average blood loss during surgery, the number and extent of lymphadenectomy performed in both groups did not differ. Authors compared laparoscopy and laparotomy in severely obese patients – they

did not find statistically significant differences. Chopin *et al.* (2009) compared the course of laparoscopy in three groups of patients: with normal body weight, overweight and obese. Average BMI among obese women was 33.3, while the BMI values ranged between 30 and 43.5. Authors observed statistically significant differences in a group of obese patients compared with women of the other two groups. The duration of the surgery, the incidence of excessive bleeding and the length of hospital stay were the main differences. They did not observe increased risk of intra- and postoperative complications in obese women. Siedhoff *et al.* (2012) qualified to the study patients with BMI ranging from 17 to 70. In 12 women, BMI was above the 40. They found that with the increase of BMI, the risk of postoperative complications, duration of surgery, number of days of hospitalization and the risk of bleeding increased.

In conclusion, it should be emphasized that panniculectomy is an alternative that allows to facilitate the access to the peritoneal cavity in extremely obese patients, especially those with other diseases that are contraindications to laparoscopic procedures.

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