

Recommendations for the standards of equipping of the Bariatric and Metabolic Surgery Center

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ABSTRACT:

Introduction: The prevalence of obesity in Poland and worldwide is constantly rising. High effectiveness of bariatric surgery has been proven in literature. It is recommended that bariatric procedures should be done by highly qualified surgeons with the appropriate, up-to-date medical equipment.

Aim: The purpose of the study is to establish Polish recommendations and standards for the use of medical equipment for bariatric surgery centers.

Materials and methods: The review of the present recommendations of the worldwide organizations and societies (including EAES, IFSO, SAGES) and guidelines was made. On the basis of current literature and authors's clinical experience we proposed standardized protocol for bariatric surgical equipment.

Conclusions: Relevant equipping of bariatric surgery centers and implementation of standardized perioperative and surgery protocols will result in significant improvements in bariatric treatment. This will ensure patients safety, a shorter length of hospital stay and considerably reduce the risk of morbidity. Moreover, it will contribute to the efficacy of the bariatric and metabolic surgery procedures, in accordance with the highest globally accepted standards.

KEYWORDS:

obesity surgery, laparoscopy, recommendations

INTRODUCTION

The frequency of prevalence of obesity and concomitant diseases is rapidly increasing in the country and the world, reaching an epidemic scale. Currently, according to results of scientific research, bariatric procedures comprise the only method of treating morbid obesity with proven efficiency. The progress of knowledge that has been made over the last decades has allowed to verify indications for surgical treatment of obesity [1]. The gold standard of surgical treatment is the use of minimally-invasive laparoscopic techniques, which are associated with a decreased share of complications and smaller perioperative morbidity [2,3]. Laparoscopic access is also associated with a reduced risk of contamination of surgical wounds and obtaining better cosmetic effects as well as a faster return of the patient to everyday life and professional activities.

It is recommended that surgical procedures of treating obesity are performed in centers that are experienced in bariatric and metabolic surgery, and have qualified staff and necessary equipment [3]. Therapy and nursing care of a patient and his preparation for a bariatric surgical procedure requires appropriate additional equipment of the ward and operating block that is adapted for patients with morbid obesity [4]. Such a center should also have the possibility to treat complications secondary to bariatric surgeries [5].

Recommendations for equipment of surgical ward for treatment of obesity

Due to the high weight of patients and often excessive posture in the surgical ward, the following equipment should be included:

1. Appropriately reinforced hospital bed with a width of up to 120 cm and a load capacity of at least 250 – 300 kg of body weight. The bariatric bed should be able to raise the bed to headrest, squatting position, Trendelenburg position to the angle of +10° and Anti Trendelenburg - 10°. The standard should additionally be equipped with handrails and extension arm with reinforced construction, solid reins that facilitate early, postoperative immobilization of patient.
2. Reinforced mattress (a vacuum mattress will provide greater comfort).
3. Suitable seat, chair, wheelchair, which will allow the patient to spend time in a favorable vertical position (improvement of lung function and blood circulation). The seat should offer a satisfactory working load of at least 250 - 300 kg body weight and appropriate seat dimensions that provide sufficient space for the patient's hips and adipose tissue and take into account the patient's body shape, apple-shaped, pear-shaped. Retrofitting the seat with wheels will enable safe transfer of the patient to any place in the hospital.
4. A bariatric couch suitable for examination and treatment, that will meet the requirements for performing everyday therapeutic and nursing activities, such as change of dressing, performing physical examination. An electric couch with height and backrest adjustment and an appropriate, safe working load of approx. 300 kg body weight is indicated.
5. Unrestrained, large-sized shower-bath, architectonically fit for

obese patients. It should be retrofitted with handrails, handles and a mobile toilet chair.

6. Solid walking frame, enabling independent movement, ability to carry own weight both in pre- and postoperative period, alternatively professional carrier for safe transfer of patient.
7. Weight adapted to weight measurement of bariatric patients (ability to measure body weight up to at least 350 kg).
8. Stairs (platforms), enabling the entry and location of a bariatric patient, e.g., on a couch, dressing table.
9. Specialized, large cuffs for proper measurement of blood pressure.

Recommendations for equipment of operating block.

The body weight of patients qualified for surgical treatment of obesity most frequently exceeds 100 kg. Regardless of the type of surgical procedure to treat obesity, it is necessary to equip the operating room with the following equipment and medical apparatus:

1. Appropriate, automated operating table that enables to safely position the patient in an anti-Trendelenburg position. Recommended table working load up to 350 kg. Equipping with accessories that allow to maintain the desired position of the patient, e.g., wide supports for the upper and lower limbs, massive straps that strap the patient to the table and prevent slipping during surgery, not impeding blood circulation in the limbs. Having a table with an exchangeable counter will allow to abandon the need to secure a proper transport trolley from the head gate to the operating room
2. Vacuum mattress, which, after pumping out the air, adapts to the patient's body and allows the patient to be properly attached to the operating table.

The laparoscopic technique is currently the choice of surgical treatment of obesity. It is therefore necessary to have:

1. A good-quality video system with an insufflator, preferably in HDTV technology that presents images in natural colors with good contrast and sharpness. The system should be equipped with the possibility to register the course of the operation and a pump, necessary for evacuation of the accumulated bodily fluids and rinsing of the operative field [6].
2. Coagulating bipolar instrument or harmonic scalpel. Preparation of tissues with the laparoscopic technique requires the use of advanced instruments for tissue cutting and coagulation. The advantage of this equipment is the possibility of secure closure of vessels with a diameter of up to 5-7 mm, and in the case of a harmonic scalpel, ensuring cutting, preparation and coagulation of tissues using a single working tool. Modern electro-surgical instrumentation also allows to reduce the consumption of surgical suture material (lowering the risk of complications secondary to infection of surgical site, due to leaving a smaller amount of foreign matter in the patient's body), significantly shortens time of surgery and minimizes blood loss [7,8,9].
3. Basic and specialized medical instruments. The number of in-

struments, their type and size depend from the performed bariatric procedure.

Recommended basic instruments for the most frequently performed bariatric procedures:

1. Handle and blade no. 11.
2. Syringe with 10 ml of 0.9% NaCl.
3. Scissors for tissue dissection.
4. Suture scissors.
5. 2 Langenbeck hooks.
6. Suction drain tip.
7. Drain for gas insufflation.
8. Veress's needle for creating pneumothorax.
9. 2 Pean forceps.
10. Clamp.
11. 2 surgical tweezers.
12. 2 Backhaus towel clamps.
13. 2 single-toothed hooks for gripping the fascia/alternatively 2 Kocher's forceps.
14. Wound care products:
 - 50 gauze swabs with X-Ray thread 7.5 cm X 7.5 cm,
 - 2 compresses 45 cm X 45 cm with X-ray thread.
15. Suture material for closing trocar site:
 - Fascia: 1-0 absorbable monofilament or multifilament suture,
 - Subcutaneous tissue: 3-0 absorbable monofilament or multifilament suture,
 - Skin: 4-0 non-absorbable monofilament,
 - Intestine/stomach: 3-0 absorbable monofilament,
 - Suture for trans-suture of Redon drain: 1-0 non-absorbable monofilament.
16. Redon drain no. 14 or 16.
17. Bag for passive Redon drain.
18. Anti-adhesive postoperative dressings.

Recommended base instruments are presented in Fig. 1.

Recommended specialized instruments for laparoscopic Roux-en-Y surgery gastric bypass (LRYGB):

1. Optical trocar Ø 10/12 mm with reduction at Ø5mm with length of 15 cm.
2. 2 trocars Ø 10/12mm with reduction to Ø5mm with length of 15 cm.
3. 2 trocars Ø 5mm or 2 Ø 10/12mm with reduction to Ø5mm with length of 15 cm.
4. Video camera or oblique optics at 30° angle with optical fiber.
5. Retractor to support the liver.
6. Curved dissector Ø 5 mm long 40 – 44 cm.
7. Curved scissors Ø 5 mm length 40 - 44 cm.
8. 2 atraumatic Jochan graspers Ø 5 mm length 40 - 44 cm.
9. Monopolar hook electrode Ø 5 mm long 40 – 44 cm.
10. Atraumatic Babcock forceps Ø 5 mm or Ø 10 mm.
11. Clamp.
12. Harmonic scalpel or advanced bipolar system, Ø5 mm or Ø10 mm, with arm length of 35 cm.

13. Clipping machine.
14. Vascular clips.
15. Endoscopic, angled linear stapler with Ø12mm articulation and load length 45mm, 60mm or universal handle.
16. Several (6-7) loads for endoscopic linear stapler with different staple heights. When choosing a load, you should be aware of tissue thickness and biomechanics.
17. Circular stapler with 25 diameter and long enough shaft (possibly with an additional anvil for ex. or-vill type).
18. Surgical gas and smoke filtration [10].

Recommended specialized instruments for laparoscopic Roux-en-Y gastric bypass surgery (LRYGB) are shown in Fig. 2.

The anesthetic team prepares:

1. 5 ml Methylene Blue 1% to check tightness of anastomosis.
2. 10 ml syringe.
3. Gastric probe 34 - 36.

Recommended specialized instruments for laparoscopic surgical resection (LSG):

1. Optical trocar Ø10/12 mm with reduction to Ø5 mm length 15 cm.
2. Trocar Ø5 mm or Ø10/12 mm with reduction to Ø5mm, length 15 cm.
3. 2 trocars Ø10/12mm with reduction to Ø5mm length 15 cm.
4. Video camera or oblique 30° optics with optical fiber.
5. Retractor to support the liver.
6. Curved dissector Ø 5 mm long 40 – 44 cm.
7. Curved scissors Ø 5 mm length 40 - 44 cm.
8. 2 atraumatic Jochan graspers Ø 5mm length 40 - 44 cm.
9. Calibration tube with graduation up to 10 cm with Ø5 mm and length 40 – 44 cm.
10. Clamp.
11. Harmonic scalpel or advanced bipolar system, Ø5mm or Ø10mm, with arm length of 35 cm.
12. Clipping machine.
13. Vascular clips to seal stapler stitches on stomach.
14. Endoscopic, angled linear stapler with Ø12mm articulation and load length 45mm, 60mm or universal handle.
15. Several (6-7 pieces) loads for endoscopic linear stapler with different staple heights. When choosing a load, you should be aware of tissue thickness and biomechanics.
16. surgical gas and smoke filtration.
17. Endo catch/bag (for removal of resected part of stomach).
18. Triangular dilator for safe removal of bag with stomach [11].

Recommended specialized instruments for laparoscopic sleeve gastrectomy (LSG) are shown in Fig. 3.

1. The anesthetic team prepares:

- Gastric probe 34-44 CDH,
- 5ml Methylene Blue 1%,
- 10 ml syringe.

Recommended specialized instruments for placement of gastric band (LGB):

1. Optical trocar Ø10 mm.
2. Ø15 mm with reduction to Ø5 mm.



Ryc.1. Recommended basic instruments for the most frequently performed bariatric procedures.



Ryc.2. Recommended specialized instruments for laparoscopic Roux-en-Y gastric bypass.

3. 2 Trocars Ø10/12 mm with reduction to Ø5 mm.
4. Gold finger.
5. Gastric band.
6. Video camera or oblique 30° optics with optical fiber.
7. Retractor to support the liver.
8. Curved dissector Ø 5mm long 40 – 44 cm.
9. Curved scissors Ø 5 mm length 40 - 44 cm.
10. 2 atraumatic Jochan graspers Ø 5mm length 40 - 44 cm.
11. Clamp.
12. Harmonic scalpel or advanced bipolar system with Ø 5 mm or Ø10 mm with arm length of 35 cm.
13. Clipping machine and vascular clips.
14. Surgical gas and smoke filtration [12].

Although the current tendency is to shift away from the establishment of bariatric bands, there are still centers in the country that decide on this operating method.

DISCUSSION

The presented recommendations base upon experiences of the authors and surgical techniques used in centers which they are part



Ryc.3. Recommended specialized instruments for laparoscopic sleeve gastrectomy.

thereof. The intention of the authors is to establish a unified guidepost for centers that are beginning to treat obesity surgically. The above material may also constitute the basis for discussions with experienced centers specializing in this field of surgery.

There is no doubt that proper equipment of a center for surgical treatment of obesity requires standardization of the procedure protocol and is one of the key factors in the correct, uncomplicated process of hospitalization. A unified procedure protocol has

fundamental meaning to ensure safety of both the patient, surgical team as well as individuals engaged in the treatment and nursing process. Available literature emphasizes that the use of standardized surgical sets adapted to individual bariatric procedures may help to develop a uniform, reproducible operating technique, which has a significant impact on the improvement of safety and comfort of work [13]. However, the meta-analysis conducted in 2016 showed that introduction of the ERAS (Enhanced Recovery After Surgery) protocol in bariatric surgery leads to a significant reduction in the length of hospital stay and a reduction in the risk of complications. The authors emphasize the significance of a properly defined, standardized preoperative procedure protocol as an integral factor that improves the patient's safety and maximizes the results of the medicinal approach [14]. It should also be emphasized that the Bariatric Center should have its own endoscopic laboratory or be able to access it quickly, in order to diagnose and treat possible complications. Apart from the recommended equipment, medical apparatus and procedure protocol, for the sake of professional care of the patient, multi-faceted education of the team of specialists of both medical and nursing staff as well as representatives of other medical professions included in the multidisciplinary team is necessary [15]. The patient should be properly prepared for surgery by an accurately trained team, that includes experts from various fields. Their task is to prepare the patient for surgical treatment and ensure correct, uncomplicated hospitalization, including treatment in the long-term postoperative period. [3,16].

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