



Peculiarities of Traditional Surgical Approaches in Pathology of Abdominal Organs in Obese Patients

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Abstract**Introduction:** Obesity in modern conditions has become a pandemic. Surgical treatment of abdominal pathology is a complex task, and the implementation of appropriate surgical approaches is not an easy task.**Objective:** To determine the peculiarities of surgical approaches during abdominal surgery in obese patients.**Materials and Methods:** Based on the observation and analysis of the treatment of 129 patients with abdominal pathology in the setting of obesity, it is proposed to improve the known surgical approaches.**Results:** The proposed weakening incisions at the corners of laparotomy wounds make it possible to technically improve the performance of accesses in obese people and reduce the risk of iatrogenic complications.**Keywords:** Surgical Access; Surgery; Operative Period; Organs of the Abdominal Cavity; Obesity**Introduction**

It is known that obesity is a fairly common phenomenon all over the globe. Obesity is a worldwide pandemic, resulting in comorbidities, socioeconomic costs, and reduced quality of life [1].

In the most recent analysis of NHANES data for 2014, the prevalence of age-adjusted obesity amongst US women was 40.4%, which represents a significant increase from the data surveyed a decade earlier when controlled for age, race, smoking status, and educational attainment [2].

In the EU, approximately 40–50% of men and 25–35% of women are overweight and 15–25% of men and women are obese [3].

Obesity can be established according to either anthropometric or body composition diagnostic criteria. The BMI, defined as weight in kilograms divided by the height in meters, squared, provides a value in units of kg/m², although these units are often omitted. Overweight encompasses subjects between 25.0 and 29.9 while Obesity (I) is defined as 30.0–34.9 and Obesity (II) as 35–39.9. Patients with a BMI ≥ 40 are referred to as having extreme or morbid obesity (III) [4].

The escalation in the prevalence of obesity throughout the world has led to an upsurge in the number of obese surgical patients to whom perioperative care needs to be delivered [5].

The Aim

In view of the above, we attempted to determine the availability and effectiveness of traditional surgical approaches for abdominal pathology in obese patients.

Materials and Methods

Based on observations of 129 obese patients (59 with grade 1 obesity, 44 with grade 2 obesity, and 26 with grade 3 obesity), we identified the main difficulties in surgical approaches for abdominal surgery. As a comparison, there were 138 patients with normal body weight (BMI ≥ 24.9 kg/m²). The patients were treated at the clinical sites of the Department of General Surgery of Vinnytsia National Medical University (Vinnytsia), the Department of Oncology of Bukovinian State Medical University (Chernivtsi), and the Bukovinian Clinical Oncology Center, Chernivtsi, Ukraine.

All patients were operated on for acute, chronic, or oncological lesions of the abdominal cavity. In particular, these were patients with gastric ulcer and duodenal ulcer, cholecystitis, gastric cancer, gallbladder cancer, colon cancer, and common bile duct pathology. All patients underwent open approaches due to the relevant contraindications to laparoscopic interventions. Based on the analysis of surgical interventions on the abdominal organs in obese patients, the following difficulties in surgical approaches were identified in comparison with patients with normal weight. All patients

were examined according to well-known rules and protocols. The groups of patients with normal body weight and obesity were comparable in terms of the list of nosologies, age and gender.

Results and Discussion

The importance of a preoperative assessment and management of the obese surgical patient population is highlighted by the associated increased risk of morbidity and mortality secondary to associated comorbidities including hypertension, diabetes, dyslipidemia and cardiovascular disease [6].

Obesity poses unique challenges in abdominal surgery due to the altered anatomy and physiology of obese patients. These challenges require specialized surgical approaches to ensure patient safety and optimal outcomes, including the use of operative surgical approaches.

Minimally invasive techniques, such as laparoscopy, are often preferred in obese patients due to reduced recovery times and lower risk of complications. However, these procedures require advanced skills and specialized equipment.

During open major surgery for obesity patients, a sufficient abdominal incision should be made to ensure an adequate surgical field. As bleeding from the adjacent fat tissue complicates the operation, meticulous dissection and hemostasis should be performed. At the same time, operations should be completed quickly and accurately because obesity patients are vulnerable to developing pressure sores from long operations. Since all tissues may be friable owing to fat deposition, an iatrogenic injury is likely to occur [7].

It should be added here that in order to reduce soft tissue trauma, in obese patients, loosening incisions of up to 1-3 cm in length should be made along the edges of the laparotomy wound. This approach makes it possible to increase the volume of the wound and improve access to the abdominal organs, which in turn reduces the risk of iatrogenic injuries.

Figure 1-3 show schemes of surgical approaches with laxative incisions. These 1-3 cm long laxative incisions offer many advantages over the traditional incision. Firstly, due to “such easing”, the wound turns from an oval shape into an almost rectangular one, which improves visualization of deeper tissues and organs. Secondly, when the wound is rectangular, the force applied to its edges to separate them becomes much smaller, which in turn reduces soft tissue trauma.

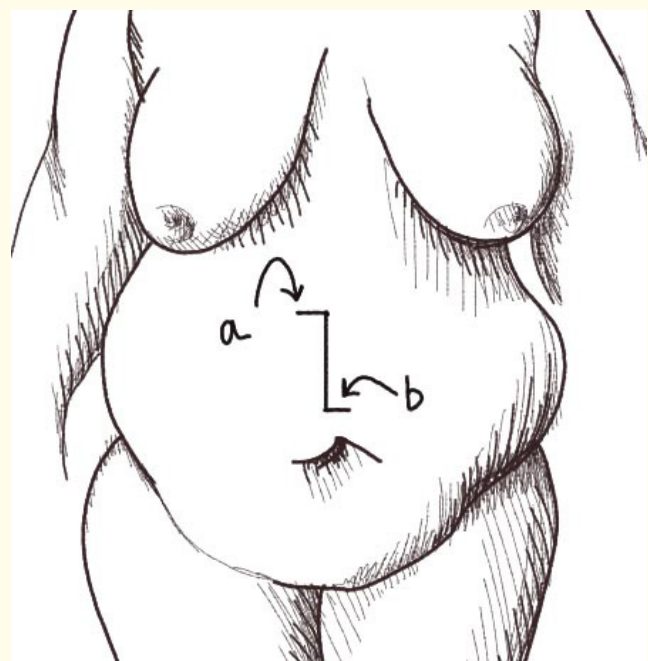


Figure 1: Scheme of upper-midline laparotomy with laxative (a, b) incisions (Fig. by O.S. Khimich).

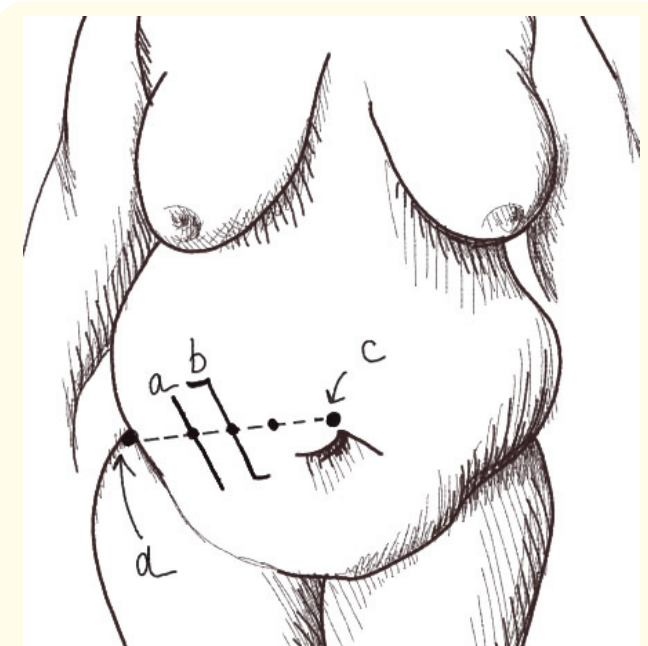


Figure 2: Scheme of accesses for appendectomy: a - McBurney access; b - our proposed improved access with displacement of the previous one to the middle and to the top with laxative incisions; c - umbilicus; d - spina iliaca anterior superior (Fig. O.S. Khimich).

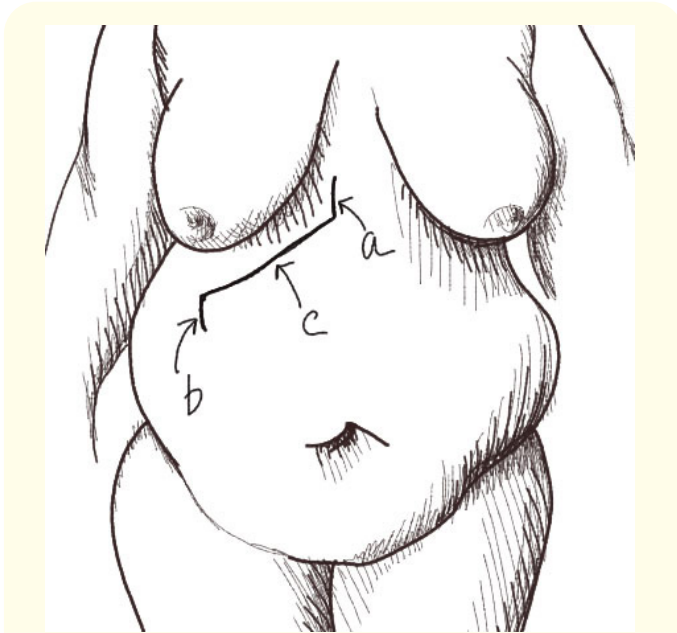


Figure 3: Scheme of accesses in the right hypochondrium (c) with our proposed lacerating incisions (a, b) (Fig. O.S. Khimich).

The vast majority of complex oncologic procedures in the field of visceral surgery have shown higher complication rates in obese patients. Meta-analyses from the last 10 to 15 years with high numbers of patients enrolled consistently have shown longer operation times, higher blood loss, longer hospital stay for colorectal procedures, oncologic upper gastrointestinal procedures, and pancreatic surgery [8].

Anatomical considerations

Obese patients often have an increased amount of visceral fat, which can obscure anatomical landmarks and complicate surgical access. In addition, excessive development of fat in the abdominal cavity can affect the topography of organs.

Surgeons must be adept at identifying these landmarks and adjusting their techniques accordingly.

The incisions themselves and the use of all auxiliary surgical instruments in obese patients should be extremely sparing, as soft tissues in obese patients are more vulnerable to trauma than in people with normal body weight.

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Conclusion

The realization that excessive fat deposition under the skin and in the abdominal cavity can lead to many iatrogenic complications requires extremely scrupulous preparation for surgical access (laparotomy). To reduce mechanical damage from the wound in obese patients, it is advisable to make loosening incisions up to 1-3 cm long along the edges of laparotomy wounds.

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