

## Review Article,

# Incisional abdominal hernias, some consideration about it

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### Abstract:

**Background:** Abdominal incision hernia is a common complication of abdominal surgery. Despite significant improvements in medical technology and healthcare, an increasing number of patients are also benefiting from complex surgical procedures. The objective of this study was to analyze the risk factors for incisional abdominal hernias and to identify measures that could reduce the incidence of this complication.

**Material and methods:** All patients included in the study are from the University Hospital of Trauma for a period of 3 years, from January 1, 2015 to December 31, 2017.

Eighty-seven adult patients who underwent surgical repair of incisional abdominal wall hernia were enrolled.

Variables that are compared in this study include, type of suture material, type of suture technique and concomitant diseases.

**Results:** According to our study the risk factors for incisional hernia are related to patients and the abdominal surgery used the size of the abdominal wall defects.

**Conclusions:** Risk factors such as the size of the defect, wound infection, obesity, use of steroids and chronic constipation have great importance and have to be strictly evaluated as they have more chances to lead to a possible recurrence...

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**Keywords:** incisional hernia, Risk factors, wound infection...

### Introduction:

Incisional hernia refers to abdominal wall hernias at the site of a previous surgical incision.

Medium incision hernias are more common than other sites, which are with all the components of the hernia such as the presence of defect, hernial sac, and herniated contents, or may be a weakness of the abdominal wall with a shallow herniated sac, and occasional bounce of content.

Surgeons are often asked to evaluate patients with incisional hernias, as they can often be symptomatic for patients. Its classic clinical presentation is a bulge after a physical exertion or cough at the incision site. In cases of complicated incisional hernias, patients have an increased risk of incarceration, obstruction (if the contents are intestinal), or strangulation.

Abdominal incision hernia can occur after any surgical procedure of the abdomen, where the abdominal wall is cut. Incisional hernia has also been reported after traumatic abdominal wall injuries [1]. Incisional hernias develop due to failure to properly close the abdominal wall [2]. Despite advances in abdominal wall closure techniques, the incidence rate of incisional hernia after laparotomy is as high as 15% to 20%. Although studies have been done on the ideal closure method to prevent incisional hernias, surgeons still often face incisional hernias. Causes of failure to close properly include: patient-related factors, disease-related factors, and technical factors [3].

The risk factors for recurrence include factors related to patient's status, underlying disease,

Surgical technique and postoperative complications. The exact pathophysiologic mechanism for development for an incisional hernia is not clearly known [4]. It is believed to be multifactorial. Associated factors like technical factors, including those relating to suturing techniques of the fascia, disease factors, and patient factors contribute to the occurrence of an incisional hernia. Intimate edge to edge fascial healing is necessary to provide the strength of fascia against the development of hernia [5]. The presence of gaps between the two healing edges that will be filled with healing scar predisposes for incisional hernia. These gaps or poor healing sites can be caused by the above risk factors in variable combinations.

Chronically increased intraabdominal pressure predisposes more weak areas to develop hernias.

Surgical technique of wound closure also plays a role. Modified *Smead Jones* technique [7] (interrupted closure of the abdominal wall using non-absorbable suture material, with sutures taken in a '*far near-near far*' fashion) has been shown to decrease the incidence of early wound dehiscence. Perioperative factors appear to have the most significant correlation to incisional hernia formation, with wound infection being the most consistently reported risk factor. Other perioperative factors include deep abscesses, perioperative gastro-intestinal complications and early reoperations. [6, 8]

**Aim of Study;** several mechanisms are reported to explain incisional abdominal hernia (IAH) risk factor. This article includes proven mechanisms of IAH, aiming to improve the preoperative preparation of the patient, current used techniques and postoperative measures.

#### **Material and methods:**

In this study there are included 87 adult patients from the University Hospital of Trauma, Tirana, Albania for a period of 3 years, from January 1, 2015 to December 31, 2017, which underwent a IAH repair.

Variables that are compared in this study involve: gender, age, duration of surgery, MBI status, post-operative wound complication, postoperative bleeding, type of surgery (acute/ elective); comorbid diseases, sort of material surgery.

#### **Data analysis;**

Statistical calculations were performed using SPSS 22.0 (Chicago, IL, USA). Data were

retrieved in February 2015. Analyses were performed to assess the impact of each investigated risk factor and to estimate the cumulative incidence of incisional hernia.

The impact of each investigated risk factor on the incidence of incisional hernia was evaluated in a time-to-event analysis, applying the date of the primary procedure, Age, body mass index (BMI), comorbid disease and type of incision as risk factors for incisional hernia were analyzed using Kendal's Tau-b.

Gender, age, BMI, history of chronic obstructive pulmonary disease, diabetes with secondary complications, operation time, postoperative wound complication and adjuvant cytostatic treatment were included as covariates in the analysis.

#### **Results:**

In 87 patients was recorded male in 48 (55.1%) and female 39 (44.9%) with age range (age 20-75) the most affected age for incision was over 55 years in females, and over 60 years in males, and correl. coefficient was 1.54 (1.11-1.68)  $p < 0.001$ .

In our study in according BMI data, we found inmost of cases 57 (65.5%), with BMI  $< 30$ , and 30 (34.5%) of cases were with BMI  $> 30$ , and correl. coefficient was 1.54(1.31-1.08)  $p < 0.001$ .

In according to the risk factors for IAH we have found these data as below; diabetes 11(12.6%), COPD (Chronic Obstructive Pulmonary Disease) in 16 (18.3%), chronic constipation in 8(9.1%), postoperative wound infection are the main risk factors which are found to be the most frequent with 24 (27.6%), followed by obesity 13(14.9%) and use of corticosteroids in 8(9.1%).

In 80(92%) of the patients is used Prolene® mesh and in only 7 (8%), the defect is repaired using a combined Prolen® and Vicryl® mesh (*Composite Polypropylene + Polyglycolic acid (Vicryl®)*). In according of suturing material, from all the patients, in 74 (85%) the mesh was fixed using Prolene® 2.0 sutures and in 13(15%) of them PDS® 2.0 sutures were used.

In according the technique of suturing, from all the patients, used to fix the mesh, in 205 patients or 64(74%) of them were used continuous sutures and in 23(26%) of patients interrupted sutures were applied.

### **Discussion:**

In 87 patients was recorded male in 48 (55.1%) and female 39(44.9%) with age range (age 20-75), the most affected age for incision was over 55 years [11] in females and over 60 years in males, and correlation coefficient was 1.54(1.11-1.68)  $p < 0.001$ .

In our study, the cumulative incidence of incisional hernia was 10.5%, which is close to that in other recent studies as *Regnard et al.* [9] but lower than that in older studies from *Ricles et al.* [10] According *Regnard et al.* the actuarial rate of incisional hernia was shown to be 13% at 5 years, occurring during the first 24 months in 80% of cases [9]

In our Study found the postoperative wound infection are the main risk factors which are found to be the most frequent with 24 (27.6%) also the *Regnard et al.* shown that the two main factors on which surgeons are able to act preventively are the choice of incision site and the onset of wound abscesses [9].

Although the overall risk for incisional hernia is low, there are patients at risk that would benefit from prophylactic measures aiming to prevent incisional hernia.

*Hesselink et al.* [12] in their study with patients who had a IAH analyzed patient-related risk factors as; gender, age, obesity, chronic cough, prostatitis, constipation, diabetes mellitus, and corticosteroid use, as well as factors associated with surgery, including surgery technique (mainly, a discontinuous layer and a continuous closure layer), use of drainage, use of antibiotics, wound contamination (fecal or purulent discharge), duration of surgery, anesthesia technique, wound complications, mortality, and hospitalization period. In our study suggests that men, patients younger than 70 years, patients with BMI > 30 and patients undergoing procedures longer than 3 h could benefit from such prophylactic measures.

*Höer et al.* [13] in their study shown the preoperative factors anemia and BMI >25, the intraoperative factors recurrent incision and previous laparotomy, were of significant influence. Furthermore, we confirm that post-operative wound complication is a risk factor for incisional hernia and suggest that active measures to avoid wound complications will reduce the incidence of hernia. As a rule, measures aiming at prevention of incisional hernia do not require large resources [9]

This high incidence may reflect failure to comply with updated guidelines or the tendency to neglect abdominal wall complication as an outcome measure following abdominal surgery in favor of others. Despite the fact that numerous studies have shown that incisional hernia and wound dehiscence are not inevitable complications following abdominal surgery, they still continue to occur after colorectal surgery.

### **Conclusions:**

This trial even though it has its limitations, comes to a conclusion that risk factors such as size of the defect, wound infection, obesity, use of steroids and chronic constipation have a great importance and has to be strictly evaluated as they have more chances to lead to a possible recurrence. Patients at high risk for developing an incisional hernia will certainly benefit from active prevention measures if these are implemented in routine surgical practice. Risk factors include the male gender, age < 70 years, obesity, long operation time and postoperative wound complications.

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### **Conflict of Interest Statement**

There is no conflict of interest

### **Authorship Contribution**

DC, AD, AGJ, EC have done the conception or design of the work and data collection and analysis. KH, HK, MK have done the data analysis and interpretation as well as drafting the article and critical revision of the article.

### **References:**

- [1] Yagnik VD, Joshipura V. Non-incisional traumatic lateral abdominal wall hernia. *ANZ J Surg.* 2017 Nov; 87(11):952-953. [[PubMed](#)]
- [2] Berrevoet F. Prevention of Incisional Hernias after Open Abdomen Treatment. *Front Surg.* 2018;5:11. [[PMC free article](#)] [[PubMed](#)]

- [3] Kaneko T, Funahashi K, Ushigome M, Kagami S, Goto M, Koda T, Nagashima Y, Shiokawa H, Koike J. Incidence of and risk factors for incisional hernia after closure of temporary ileostomy for colorectal malignancy. *Hernia*. 2019 Aug; 23(4):743-748. [PubMed]
- [4] Van den Hil LCL, Vogels RRM, van Barneveld KWY, Gijbels MJJ, Peutz-Kootstra CJ, Cleutjens JPM, Schreinemacher MHF, Bouvy ND. Comparability of histological outcomes in rats and humans in a hernia model. *J Surg Res*. 2018 Sep; 229:271-276. [PubMed]
- [5] Belokonev VI, Pushkin SIu, Fedorina TA, Nagapetian SV. [A biomechanical concept of the pathogenesis of postoperative ventral hernias]. *Vestn Khir Im I I Grek*. 2000;159(5):23-7. [PubMed]
- [6] Regnard JF, Hay JM, Rea S, Fingerhut A, Flamant Y, Maillard JN. Ventral incisional hernias: Incidence, date of recurrence, localization and risk factors. *Ital J Surg Sci* 1988;18:259-65.
- [7] Wallace D, Hernandez W, Schlaerth JB, Nalick RN, Morrow CP. Prevention of abdominal wound disruption utilizing the SmeadJones closure technique. *Obstet Gynecol* 1980; 56:226-30.
- [8] Chan G, Chan CK. A review of incisional hernia repairs: Preoperative weight loss and selective use of the mesh repair. *Hernia* 2005; 9:37-41.
- [9] Regnard JF, Hay JM, Rea S, Fingerhut A, Flamant Y, Maillard JN. Ventral incisional hernias: Incidence, date of recurrence, localization and risk factors. *Ital J Surg Sci* 1988; 18:259-65.
- [10] CT A, Rickles AS, Probst CP, Kelly KN, Deeb AP, Monson JR, Fleming FJ. Visceral obesity, not elevated BMI, is strongly associated with incisional hernia after colorectal surgery. *Dis ColonRectum*. 2015;58 (2): 220 – 227. doi: 10.1097/DCR.000000000000261. [PubMed] [CrossRef] [Google Scholar]
- [11] Cobani, D., Dogjani, A., Gjata, A., Haxhirexha, K., & Bendo, H. (2021). Management of Inguinal Hernia in a Tertiary Center, a two-year Retrospective Study. *Albanian Journal of Trauma and Emergency Surgery*, 5(2), 854-858. <https://doi.org/10.32391/ajtes.v5i2.243>
- [12] Hesselink VJ, Luijendijk RW, deWilt JH, et al. An evaluation of risk factors in incisional hernia recurrence. *Surg Gynecol Obstet* 1993; 176:228–234.
- [13] Höer J, Lawong G, Klinge U, Schumpelick V. Einflussfaktoren der Narben hernienentstehung. Retrospektive Untersuchung a 2.983 laparotomierten Patienten über einen Zeitraum von 10 Jahren [Factors influencing the development of incisional hernia. A retrospective study of 2,983 laparotomy patients over a period of 10 years]. *Chirurg*. 2002 May;73(5):474-80. German. doi: 10.1007/s00104-002-0425-5. PMID: 12089832.