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Prevention of Subfascial Hematomas During Emergency Caesarean Sections

Valiev Shukhrat Nasimovich[1], Negmadjanov Bahodur Boltaevich[2]

[1]Samarkand State Medical University, Department of Obstetrics and Gynecology No2, Doctoral Student Samarkand, Uzbekistan
[2]Samarkand State Medical University, Department of Obstetrics and Gynecology No2, Head of Department Samarkand, Uzbekistan

Abstract The article presents data on the incidence of subfascial hematomas using various surgical approaches during emergency caesarean sections. The frequency of hematomas increases in postpartum women with several scars and in the presence of pregnancy complications such as preeclampsia, eclampsia, etc. The latest temporary guidelines express the opinion of "conducting emergency cesarean sections, but it is necessary to take into account all preventive measures to eliminate coagulopathic and hypotensive complications in the form of bleeding." It should be noted that these recommendations do not provide clear instructions that reflect the most optimal technique for performing a cesarean section that should be followed, nor does it provide information about the preferred access for emergency cesarean sections. Having analyzed and performed hundreds of emergency cesarean sections, we believe that during emergency surgical childbirth, the incision of the anterior abdominal wall should be made in the lower median (classical) line, which is less traumatic and quick to perform with fewer postoperative complications. A surgical technique is proposed to help prevent postoperative subfascial hematomas during muscle avulsions and tears.

Keywords Cesarean section, Lower midline incision, Subfascial hematoma, Ligature a. epigastrica superficialis

1. Introduction

Physiological delivery of pregnant women is the main condition for preventing and reducing the incidence of subgaleal hematomas after cesarean section for emergency indications [1].

In recent years, caesarean section has become widespread in obstetrics and represents the most common surgical intervention. The incidence of caesarean sections shows no tendency to decrease and is currently 11-29% in many countries of the world, and some countries provide information on the frequency of 35-40%, which is a national disaster [2-4]. It should be said that since its inception, the cesarean section operation, which was designed to save the life of a pregnant woman, has become synonymous with childbirth. This became possible thanks to the improvement of surgical techniques, the emergence of modern absorbable suture materials, etc. [5].

In our country, over the last decade, obstetrician-gynecologists often, without justification, routinely perform transverse incisions to access the pelvic organs. As a result of damage to the muscles of the anterior abdominal wall, maternal mortality has increased [6-10].

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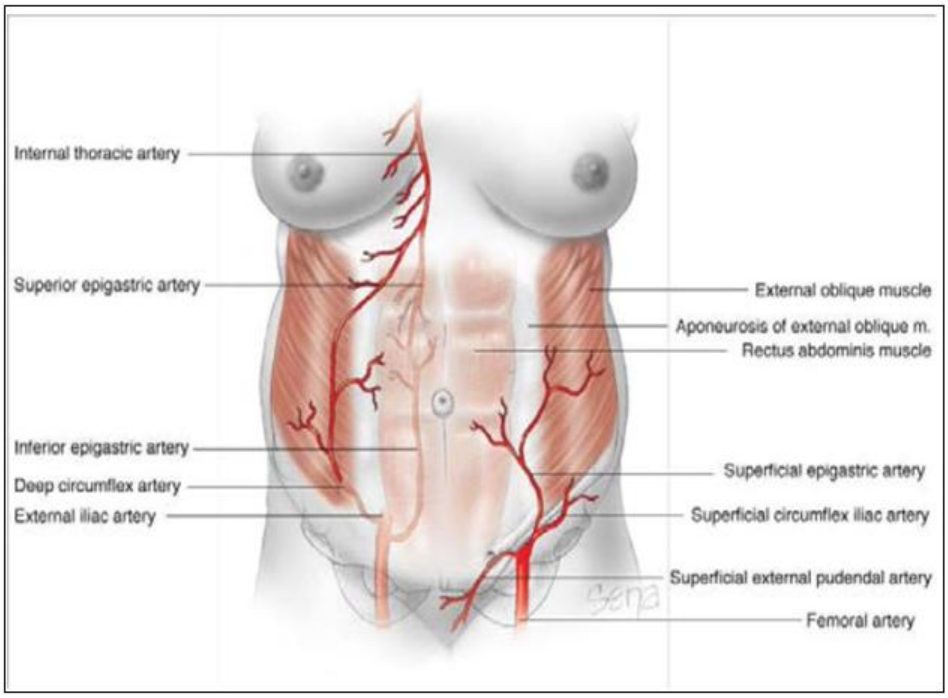
Referring to the book on the topographic anatomy of the anterior abdominal wall, it can be seen that Picture 2 shows the location and architectonics of the vessels. Every operator should know this, because otherwise, with incorrect tactics and careless handling during a cesarean section operation, they can be damaged. Complications that are the cause of relaparotomy after surgical delivery are in the following sequence: purulent-septic, early adhesive intestinal obstruction and the next after them are hemorrhages. 0.06% - 0.34% is the percentage of operated patients whose indication was intra-abdominal bleeding. Particular attention is paid to the mortality rate after operations performed for bleeding; their percentage ranges from 27% to 75% [11].

A significant place in the structure of postoperative complications is given to subfascial hematomas. Hematoma localized in the subgaleal space or, in other words, in the vaginal area m. rectus abdominis is a hematoma localized outside the abdominal cavity, increasing in the vagina m. rectus abdominis. Topographically it is localized with m. rectus abdominis and fascia transnversa Coopera (pic. 1).

Bleeding - which causes subfascial hematomas and is a consequence of superficial injury inferior epigastric artery - or rupture m. rectus abdominis during surgical delivery [12,13].

Picture 1. Subfascial hematoma after cesarean section



Picture 2. Anatomical and topographical features of the anterior abdominal wall

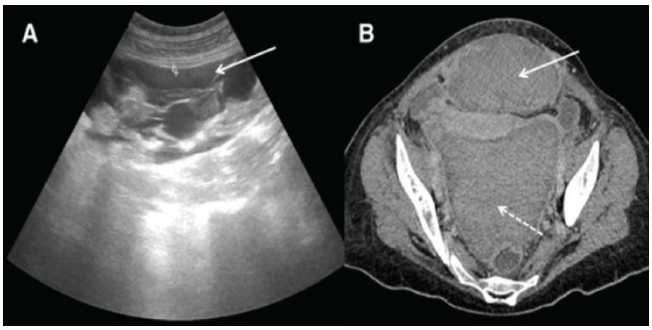
Pfannenstiel method of laparotomy during abdominal birth is one of the most common causes of bleeding from the vessels of the anterior abdominal wall; they, in turn, are a source of hematoma in the postoperative period [14,15]. The incidence of postoperative complications, such as subfascial hematomas, with this cesarean section approach in pregnant women without pathological pregnancy and preserved hemostasis is 2–10% [16,14]. With coagulopathic changes in the hemostatic system in pregnant women (for example, severe preeclampsia, PONRP), the percentage of occurrence of the above hematomas increases significantly and reaches 35–40%, which aggravates the severity of the mother's condition and dictates the further course of the morbidity [14,15]. The turning point leading to damage and further bleeding with this approach is the separation of the dissected aponeurosis upward from m. rectus et obliques abdominis to the navel. Superficial inferior epigastric artery is the very place where hematoma formation occurs. The above vessel begins with a branch from a. femoralis, above the inguinal ligament, then directed towards the direction in front of the bladder, then by perforation fascia transversa enters the posterior vagina m. rectus abdominis [17]. A branch 6 to 8 cm long passes through m. rectus abdominis. Considering the above, we can say with confidence that even a slight stretch of this section of the artery leads to its rupture. Superficial inferior epigastric artery is characterized by the following features: diameter from 0.75 to 31.5 mm, length - from 4 to 8 mm, this branch of the artery may be absent in 6–15% of people. Consequence of ruintura superficial inferior epigastric arteries are:

1. Subfascial hematoma within the rectus abdominis muscle (hematoma of the sheath of the rectus abdominis muscle) posterior to the rectus and transverse muscles and anterior to the peritoneum. In

most cases they are one-sided.

2. Blood often collects in the thickness of the rectus and transverse muscles of the anterior abdominal wall in front of the peritoneum or deepens into the prevesical space, called the Retzius Space [18]. The space of Retzius is a retropubic, retroperitoneal space, located posterior to the symphysis and anterior to the bladder, extending to the level of the navel (pic. 3). The upper pole of the space of Retzius is a triangle formed by the upper edge of the symphysis pubis and on the sides by the lateral edges of the pyramidal muscles attached to the symphysis pubis [19].
3. If the peritoneum is not sutured, bleeding from the subfascial space can cause hematoperitoneum [20] (pic. 4).

Picture 3. Subfascial hematoma (white arrow) in the thickness of the anterior abdominal wall in the patient on the 5th day after CS. Hematoma of the space of Retzius



Picture 4. Subfascial hematoma leading to massive hemoperitoneum. A - CT scan showed accumulation of blood in the rectus abdominis muscles (white arrow). B - after contrast, CT confirmed a subfascial hematoma (white arrow) and also showed hemoperitoneum (dashed arrow)

Clinic of subfascial hematomas

A subfascial hematoma can develop quite quickly and progress to a large size, which causes the development of hypovolemic shock, often as a result of its penetration either into the abdominal cavity or into the retroperitoneal space of Retzius. It should also be noted that in most cases, the hematoma develops little by little, its effect on the opened vessels is often complete for them to be plugged with spilled blood. The clinical manifestations of a hematoma are determined by its size and location. In many cases, a subgaleal (subfascial) postoperative hematoma occurs. After surgery, a woman usually complains of pain and discomfort in the area of the postoperative wound, and a low-grade fever gradually develops. The clinical picture of subfascial hematomas is associated with an increase in the volume of the hematoma, dissection of surrounding tissues and associated significant pain. A decrease in the intensity of previously severe pain in the thickness of the anterior abdominal wall in such patients signals a deterioration in the patient's condition. This is a sign of emptying of the subfascial hematoma into the retroperitoneal space of Retzius or into the abdominal cavity with the formation of hemoperitoneum (pic. 4). Clinical manifestations of a hematoma in the area of the Retzius space are polymorphic: paradoxical ischuria (with imbibition of the bladder wall and/or hematoma of paravaginal tissue), tenesmus (with a hematoma in the area of pararectal tissue). In this condition, the volume of blood loss increases rapidly and, in addition to the pain symptom, manifestations of hemorrhagic shock can be observed. A subfascial hematoma of the anterior abdominal wall after surgical delivery is easily accessible for palpation, which cannot be said about a parietal hematoma of the pelvis (for this complication, ultrasound examination or computed tomography is used). In this case, a dynamic ultrasound is performed, the hemoglobin level is monitored and, if possible, an MRI is performed (which shows the source of bleeding). Huge, rapidly expanding hematomas lead to anemia in patients.

2. Methods

Surgical care for subfascial hematomas of the anterior abdominal wall after surgical delivery is necessary in the following cases:

1) a transient increase in size of the hematoma;
2) the appearance of signs of anemization;
3) hematoma with heavy external bleeding [21,22].

Technique of surgical treatment of subfascial hematomas of the anterior abdominal wall after cesarean section.

A 3-step method is recommended:

Stage 1: opening of the hematoma, hemostasis - ligation of bleeding vessels. If it is impossible to identify the bleeding vessel, mattress sutures are placed.

Stage 2: emptying the contents of the hematoma.

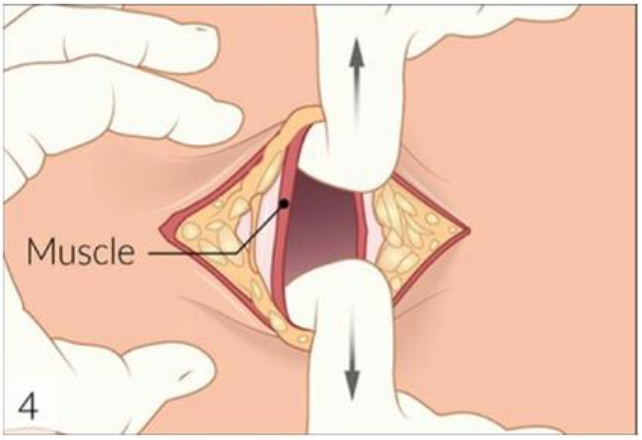
Stage 3: final hemostasis.

In order to prevent the formation of subfascial hematomas during emergency cesarean sections, we recommend the following:

1) The incision during emergency CS operations is carried out primarily through the lower medial approach. The incidence of subfascial hematomas with this incision occurs, according to our data, in 7–8% of cases. In addition, unlike other incisions, CS is associated with

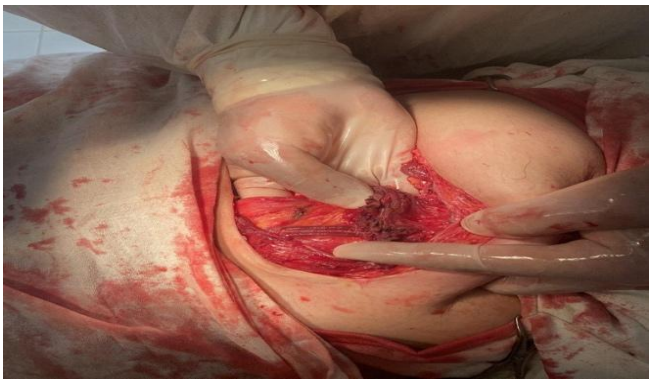
less fever, pain, and analgesic requirements and a shorter duration of surgery and hospital stay [23].

2) We propose to make an incision in the anterior abdominal wall and open the aponeurosis during the CS operation along the white line of the abdomen. Considering the size of the avascular zone (pic. 5).

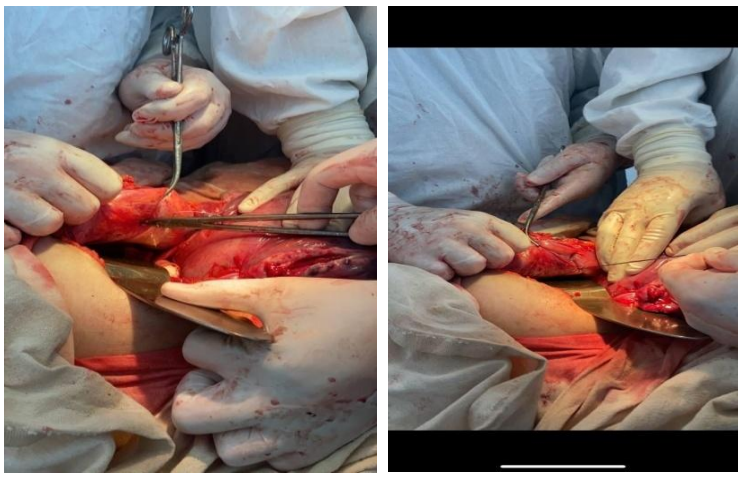


Picture 5. Optimal opening of the aponeurosis vertically in the cranial -caudal direction (down: to the upper edge of the pyramidal muscles and up: maximum to the umbilicus), which will not lead to damage to a. superficial inferior epigastric

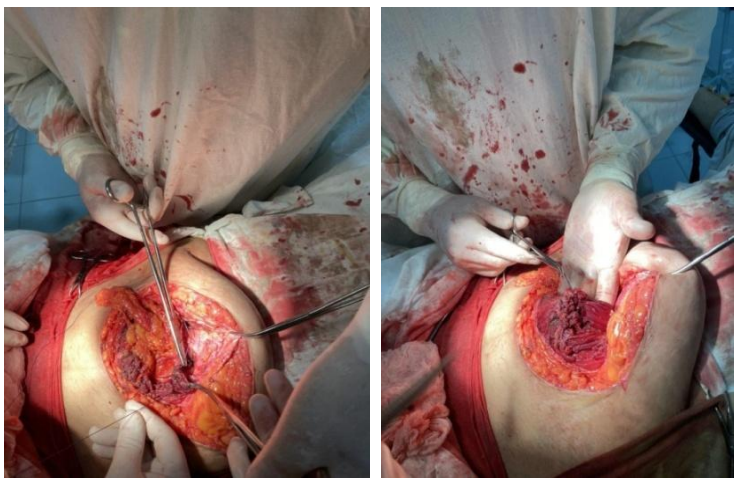
3) We suggest opening the aponeurosis in the craniocaudal direction (down: to the upper edge of the pyramidal muscles and up: maximum to the navel) (pic. 5).
4) Sever the muscles from the aponeurosis, especially in women with scars after a cesarean section. The criterion for good access is muscle integrity.
5) If these rules are not followed, muscle damage occurs, such as **tearing, rupture and separation** of the muscles of the anterior abdominal wall (pic. 6).



Picture 6. Location a. epigastrica superficialis inferior in relation to the muscle



Picture 7. Ligation a. epigastrica superficialis inferior



Picture 8. Suturing muscles - restoring their integrity

In case of muscle tears, it is recommended to carry out hemostasis by coagulating the site of the tear; as experience shows, this is sufficient to prevent bleeding. For muscle ruptures, coagulation and subsequent ligation are recommended. epigastrica superficialis inferior (pic. 7).

In case of muscle avulsions, along with bandaging a. epigastrica superficialis inferior perform suturing of the muscles to restore their integrity (pic. 8).

3. Results

Thus, the formation of subfascial hematomas after abdominal birth is associated not only with anatomical features, but also the difficulties of performing a cesarean operation are available sections, leading to damage vessels And hemorrhagic complications with the subsequent addition of an inflammatory component, formation insolvent seam on uterus, what increases risk generalized purulent-septic complications.

Prevention complications postpartum period must start in maternity home by identifying female patients with risk factors and prevention implementation of these factors. In communications With high frequency abdominal childbirth and increasing shares postoperative complications in everyone diseases postpartum period should stick to higher listed surgical and clinical moments.

REFERENCES

[1] Farag D., Bakr M., Zedan H., Hassan H., Eid S. Maternal and Newborn Outcome among Women Undergoing Elective versus Emergency Caesarean Section: A Comparative Study. Egyptian Journal of Health Care, (EJHC), 2023; 14 (3): 454-468. DOI: 10.21608/EJHC.2023.317867.

[2] Hassan H., El-Sadek A., Ali L. Effect of Three Different Nursing Interventions on Intestinal Motility and Women's Satisfaction Post-Cesarean Section Birth. American Journal of Nursing Research, 2019; 7(6): 932-941. doi: 10.12691/ajnr-7-6-4.

[3] Hassan H. Impact of Nursing Intervention on Relief of Breast Engorgement: Among Women with Caesarean Section. A Thesis Submitted to Faculty of Nursing, Benha University, 2011.

[4] Brown C.E., Dunn D.H., Harrell R., Setiawan H., Cunningham F.G. Computed tomography for evaluation of puerperal infections // Surg Gynecol Obstet. - 1991. - Vol. 172. - P. 285-289.

[5] Diriba K., Awulachew E., Getu E. The effect of coronavirus infection (SARS-CoV-2, MERS-CoV, and SARS-CoV) during pregnancy and the possibility of vertical maternal-fetal transmission: a systematic review and meta-analysis // Eur J Med Res. - 2020. - Vol. 25 (1). - P. 39. doi:10.1186/ s40001-020-00439-wPMID: 32887660; PMCID: PMC7471638.

[6] Hassan H., EL-Kholy G., Ateya A., Hassan A. Breast Feeding Knowledge and Practices among Primiparous Women with Caesarean Section: Impact on Breast Engorgement in Upper Egypt. Communication, Society and Media, 2020a; 3(2): 34-78.

[7] Hassan H., EL-Kholy G., Ateya A. & Hassan A. Breast Engorgement among Women with Caesarean Section: Impact of Nursing Intervention. Education, Society and Human Studies, 2020b; 1(2): 22-55. doi:10.22158/eshs.v1n2p22.

[8] Hassan H., Zedan H., Farag D. Successful Vaginal Birth Subsequent to Cesarean Section. Mansoura Nursing Journal, 2024; 11(1).

[9] Hassan H. Impact of Nursing Intervention on Relief of Breast Engorgement among Women with Caesarean Section. International Standard Book Number (ISBN) 978-620-3-58246-8, LAMBERT: Academic Publishing. 3/2021.

[10] Flávio C.H., Rudolph O.K. Morphometry and Frequency of the Pyramidalis Muscle in Adult Humans: A Pyramidalis Muscle's // Anatomical Analysis, Clinics. - Sao Paulo, 2020. - P. 23–25.

[11] Kamaya A., Ro K., Benedetti N.J., Chang P.L. Imaging and diagnosis of postpartum complications: sonography and other imaging modalities // Ultrasound Q. - 2009. - Vol. 25. - P. 151-162.

[12] Lovering R.M., Anderson L.D. Architecture and fiber type of the pyramidalis muscle // Anat Sci Int. - 2008ю - Vol. 83 (4). - P. 294–297.

[13] Lee S.M., Shin J.H., Shim J.J. et al. Post-partum haemorrhage due to genital tract injury after vaginal delivery: Safety and efficacy of transcatheter arterial embolisation // Eur Radiol. 2018. - Vol. 28. - P. 4800–4809.

[14] Parazzini F., Bortolus R., Mauri P.A., Favilli A., Gerli S., Ferrazzi E. Delivery in pregnant women infected with SARS-CoV-2: A fast review // Int J Gynaecol Obstet. - 2020. - Vol. 150. - P. 41–60.

[15] Perioperative management for cesarean section in COVID-19 patients // Bali Journal of Anesthesiology. - 2020. - Vol. 4 (5). - P. 13.

[16] Rodgers S.K., Kirby C.L., Smith R.J., Horrow M.M. Imaging after cesarean delivery: acute and chronic complications // Radiographics. - 2012. - Vol. 32. - P. 1693-1712. DOI: 10.1148/rg.326125516.

[17] Rosa F. Imaging findings of cesarean delivery complications: cesarean scar disease and much mor // Insights into Imaging. - 2019. - Vol. 10. - P. 98–107.

[18] Sierra A., Burrel M., Sebastia C. et al. Utility of multidetector CT in severe postpartum hemorrhage // Radiographics. - 2012. - Vol. 32. - P. 1463–1481. DOI: 10.1148/rg.325115113.

[19] Shyama Prasad Saha. A randomized comparative study on modified Joel-Cohen incision versus Pfannenstiel incision for cesarean section // Journal of the Turkish German Gynecology Association. - Vol. 14 (1). - P. 28–34. DOI: 10.5152/jtgga.2013.07.

[20] Valiev Sh.N., Negmadjanov B.B., Kim V.O. Damage to the muscles of the anterior abdominal wall due to irrational choice of access for abdominal delivery. Tibbiyotda yangi kun 2020, No4 (34), pp.125-128.

[21] Valiev Sh.N., Negmadjanov B.B., Cesarean section: the choice of access as one of the ways to reduce postoperative complications. Doctor Ahborotnomasi. – Samarkand, 2022. -

No2.1 - pp. 57-60.

[22] Valiev Sh.N., Negmadjanov B.B., Caesarean section in women with a uterine scar. Modern methods of management (literature review). Journal of reproductive health and uro -nephrology research. – Samarkand, 2022, volume 3, issue 3, pages 11-18.

[23] Koreyba K.A., Ibatullin I.A. Topographic-anatomical rationale for the introduction of trocars during endoscopic operations in abdominal surgery // KMZh. - 2003. - T. 84, No. 5. - P. 360-362.