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CHARACTERISTICS OF RADIOLOGICAL DIAGNOSTICS OF COMPLICATIONS AFTER ABDOMINAL SURGERY AND ABDOMINAL DELIVERY

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The purpose of the study was to determine the diagnostic efficiency of ultrasound examinations and computed tomography in detection of complications after surgery for Crohn's disease and nonspecific ulcerative colitis, as well as abdominal delivery. The study included 21 women who gave birth by cesarean section. The study also included 40 patients who had previously undergone surgery for colitis and Crohn's disease. All patients underwent comparative analysis of ultrasound and computed tomography data during the observation period. In none of these cases was ultrasound examination a reliable diagnostic tool for detection of complications after cesarean section. Computed tomography demonstrated very high or complete accuracy in all three cases and proved its high efficiency in diagnostics of complications arising after surgical treatment of colitis and Crohn's disease.

Key words: abdominal surgery, intestinal obstruction, Caesarean section, Crohn's disease, radiological diagnostics, ultrasound, computed tomography.

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ОСОБЛИВОСТІ ПРОМЕНЕВОЇ ДІАГНОСТИКИ УСКЛАДНЕНЬ ПІСЛЯ АБДОМІНАЛЬНИХ ОПЕРАЦІЙ ТА АБДОМІНАЛЬНИХ ПОЛОГІВ

Метою дослідження було визначення діагностичної ефективності ультразвукових досліджень і комп'ютерної томографії у виявленні ускладнень після операцій з приводу хвороби Крона і неспецифічного виразкового коліту, а також абдомінальних пологів. До дослідження було включено 21 жінку, яка народила шляхом кесаревого розтину. Також до дослідження було включено 40 пацієнтів, які раніше перенесли хірургічне лікування з приводу коліту та хвороби Крона. Всім пацієнтам протягом періоду спостереження проводився порівняльний аналіз даних УЗД та комп'ютерна томографія. У жодному з цих випадків ультразвукове дослідження не було надійним діагностичним інструментом для виявлення ускладнень після кесаревого розтину. Комп'ютерна томографія продемонструвала дуже високу або повну точність у всіх трьох випадках і довела свою високу ефективність у діагностиці ускладнень, що виникають після хірургічного лікування коліту та хвороби Крона.

Ключові слова: абдомінальна хірургія, кишкова непрохідність, кесарів розтин, хвороба Крона, променева діагностика, УЗД, комп'ютерна томографія.

Complications following abdominal surgery are common in the emergency department. Many postoperative complications (e.g., infection, abscess, hematoma, and active bleeding) are common to all types of surgery, while others are specific to certain types of surgery. Computed tomography (CT) is a commonly used imaging technique to diagnose postoperative complications. This article reviews findings that may be mistaken for pathology after some of the most common abdominal procedures, findings that may be considered normal after surgery, and common early complications [1].

Acute severe ulcerative colitis is an emergency requiring hospitalization. Treatment is most effective in a multidisciplinary team setting in specialized centers or under the supervision of a specialist [9].

Researchers have noted complications such as perforation, peritonitis, fistula, intestinal obstruction, rectal complications, and proctitis after surgery for Crohn's disease [6, 12]. Crohn's disease (CD) is a chronic inflammatory bowel disease that is complicated by genetic susceptibility and environmental triggers [5]. It is most frequently diagnosed in individuals between the ages of 20 and 30 [11]. At present, the underlying cause of CD is still unknown, and its prevalence is gradually increasing worldwide. CD is prone to various US complications, with intestinal obstruction being one of the most common [10].

Cesarean section (CS), also known as cesarean delivery, refers to the delivery of the fetus, placenta and membrane through abdominal and uterine incision after fetal viability [4]. Globally, the cesarean section rate is unevenly distributed and results in 21.1 % of abdominal deliveries. For example, African countries account for approximately 5.0 % of cesarean sections worldwide [7].

Considering the above, it is of great importance to study the effectiveness of radiological diagnostic methods in the diagnosis of abdominal surgeries and postpartum complications [2, 3].

The purpose of the study was to determine the diagnostic effectiveness of ultrasound and computer tomography imaging methods in detecting complications after surgeries for Crohn's disease and non-specific ulcerative colitis, as well as abdominal deliveries.

Materials and methods. The study included 40 patients who underwent surgery for Crohn's disease and non-ulcerative colitis at the M.A. Topchubashov ECM In 2016–2022 year. All patients underwent US and CT examinations in the postoperative period.

The study included 21 women who gave birth by cesarean section (CS). Complications were detected in each of them in the postpartum period. In order to determine the diagnostic effectiveness of CT and US, women were divided into 2 groups: in group I, 9 women underwent only US, and in group II, 12 women underwent CT. The study also included 40 patients who had previously undergone surgical treatment for colitis and Crohn's disease.

To determine the sensitivity, specificity, as well as the prognostic value and diagnostic accuracy of some methods of radiation diagnostics used in studies, more precisely ultrasound and CT, in the diagnosis of acute postoperative pancreatitis, a 2×2 random number table was used. The sensitivity (Se); specificity (Sp); positive predictive value (PPV); negative predictive value (NPV); diagnostic efficiency (Acc) of the CT diagnostic method were determined.

Statistical analysis was performed using the “IBM Statistics SPSS-26” program, and the statistical significance of the differences between the parameter indicators was determined using the criteria for comparing the quantitative indicators of two or more independent groups. A value of $p \leq 0.05$ was considered significant.

Results of the study and their discussion. It is crucial for a colon and rectal surgeon to understand the principles of examination and treatment of patients with both small and large bowel obstruction. Other commonly used imaging modalities include radiography and contrast scanning/fluoroscopy, and less commonly, ultrasound and magnetic resonance imaging. Regardless of the imaging modality used, interpretation of the results should be based on a systematic methodological approach to ensure diagnostic accuracy. The conducted studies revealed that different indicators were obtained for CT and US parameters in the detection of intestinal obstruction. Thus, in the detection of acute intestinal obstruction, FC (completely correct) was detected in 22 (78.5 %) patients, PC (relatively correct) in 6 (21.4 %) patients. No patients were registered for the NC (incorrect) parameter. When acute intestinal obstruction was detected by US, FC was detected in 8 (38.6 %) patients, PC in 17 (60.7 %) patients. Unlike CT, NC was detected in 3 (10.7 %) patients during US. During subacute intestinal obstruction, CT had FC in 8 (66.7 %) patients, and NC in 4 (33.3 %) patients. PC, i.e. relative accuracy, was not found in any patient. FC during US was detected in 8 (28.6 %) patients.

This was also 50 % less than CT, that is, the true result in detecting acute bowel during US was 50 % less than CT. PC was 60.7 % during US. This was up to 40 % more than CT. Relatively correct results were fewer in CT than in US. In case of acute intestinal obstruction, the false response was also recorded in US, but not in CT. In case of subacute intestinal obstruction, the NC parameter was 33.3 % in CT and 41.7 % in US (Table 1).

Table 1

Diagnostic value of CT in acute intestinal obstruction after surgery for colitis and Crohn's disease (n=40)

Parameter	Acute intestinal obstruction			Subacute intestinal obstruction		
	FC	PC	NC	FC	PC	NC
CT	22	6	0	8	0	4
	78.6 %	21.4 %	0.0 %	66.7 %	0.0 %	33.3 %
Ultrasound (US)	8	17	3	0	7	5
	28.6 %	60.7 %	10.7 %	0.0 %	58.3 %	41.7 %

Note: FC (Fully Correct) indicates that both the obstruction and its cause have been correctly identified. PC (Partially Correct) means the obstruction is detected, but the underlying cause is not. NC (Not Correct) signifies that the obstruction was not correctly identified or detected.

In the detection of colitis by US during acute intestinal obstruction, FC (Fully Correct) was recorded in 6 (37.5 %) patients, PC (Partially Correct) in 6 (62.5 %) patients. The NC (Not Correct) parameter was not present in one patient. During US for Crohn's disease, FC was recorded in 3 (25.0 %), PC in 6 (50.0 %), NC in 3 (10.7 %) patients. When subacute intestinal obstruction was diagnosed, FC and PC were not present in any patient. When colitis was detected by CT, FC was registered in 10 (62.5 %) patients, and in 6 (37.5 %) patients. NC was not detected in any patient. In CT examination of Crohn's disease during intestinal obstruction, FC was found in 9 (75.0 %), PC in 3 (25.0 %) patients. NC was not detected in Crohn's disease in any patient. However, when all degrees of small bowel obstruction are taken into account, the reliability of CT decreases sharply (sensitivity is 64 %, and specificity is 79 %). Thus, CT is not an ideal method for diagnosing low-grade or subacute obstruction.

Crohn's disease is characterized by the development of a number of complications, including intestinal strictures and intestinal obstruction. Patients with Crohn's disease who develop an intra-

abdominal abscess typically experience recurrent intra-abdominal abscesses during follow-up. Intestinal strictures caused by Crohn's disease lead to intestinal obstruction. In the second stage of the study, the effectiveness of radiological diagnostic methods of complications after Caesarean section was analyzed (Table 2).

Table 2

Postoperative complications after cesarean section

Parameter	Group I (n=9) (US)		Group II (n=12) (CT)	
	Abs.	%	Abs.	%
Other surgeries	4	44.4	5	41.6
Changes in the bladder	2	22.2	4	33.3
Urethral changes	1	11.1	2	16.7
A foreign body in the abdominal cavity	-	-	1	8.3
Inflammatory processes in the small pelvis	2	22.2	-	-

In both groups, there were women who underwent other surgical procedures in addition to CS: 44.4 % in group I, 41.6 % in group II. Bladder changes and urethral changes. These cases were detected more often in the group examined by CT. Bladder disorders were detected in 22.2 % of cases in group I, 33.3 % in group II, and urethral disorders in 11.1 % in group I, 16.7 % in group II.

There was no foreign body in the abdominal cavity in group I. In group II, it was present in 8.3 % of cases. In group II, there was no inflammation of the pelvic organs. In group I, it was present in 22.2 % of cases. If changes in the bladder were not detected, the diagnostic efficiency of US Sensitivity (Se); Specificity (Sp), Diagnostic accuracy (Acc) was not recorded. This examination was completely unsuccessful in detecting this symptom. High indicators (Se: 0.97, Sp: 1.00, Acc: 0.98) were achieved on CT.

CT has a very high diagnostic quality in detecting this pathology. In urethral trauma, the sensitivity and accuracy of US are very low (Se: 0.27, Acc: 0.08). The sensitivity and specificity of CT (0.97, 1.00) were very high, showing itself as a very accurate and reliable method. To determine the value of CT in diagnosing bladder and posterior urethral injuries, international authors retrospectively evaluated CT and ultrasound findings in patients with suspected lower urinary tract injuries who had both scans performed at initial evaluation [5]. These results indicate that CT is sensitive for detecting bladder injuries but not for diagnosing urethral injuries. However, computed tomography (CT) is generally the most appropriate and accurate diagnostic imaging modality for suspected intestinal obstruction [8].

Low indicators were obtained in the detection of a foreign body in the abdominal cavity by US (Se: 0.27, Acc: 0.08). It can be said that it was almost impossible to detect it by US. The accuracy during CT was high (Se, Sp, Acc – 1.00). CT perfectly detects this symptom.

According to the data we obtained, which are consistent with the results of other authors, radiographic studies, such as computed tomography (CT) scans, play an important role in assessing the severity of the disease and complications in patients with Crohn's disease [12]. According to foreign authors, the sensitivity of CT for diagnosing high-grade obstruction is 81–94 %, and the specificity is 96 % [1].

According to our data, complications after cesarean section may include infection, bladder injury, and, in rare cases, foreign body entry into the abdominal cavity and urethral changes, which is confirmed by data from other authors [7].

Conclusion

Thus, US was not a reliable diagnostic tool in any of these cases in the detection of complications after CS. CT showed very high or complete accuracy in all three cases. It clearly shows that CT is the diagnostic gold standard for selected urogenital pathologies.

CT has proven to be highly effective in diagnosing complications that arise after various abdominal surgeries. It provides optimal visualization of various abdominal structures, helping to identify problems such as foreign bodies or intestinal obstruction that may arise after cesarean sections and surgical treatment for colitis and Crohn's disease. This is evidenced by X-ray studies conducted by foreign authors, which indicate the important role of computed tomography in assessing the severity of Crohn's disease and its complications. CT can help in making decisions about timely diagnosis and treatment of the above pathological conditions and potentially reduce the need for diagnostic surgical interventions.

Taking into account the above, it is important to keep statistics of complications arising after abdominal operations all over the world, as well as their timely detection with an increase in the professional level and with the widespread use of innovative technologies in the field of radiation diagnostics in the treatment process, which will allow, based on the results of scientific research conducted in this area, to develop algorithms for optimal diagnostics and increase the effectiveness of treatment within the limits of possibilities.

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DETERMINATION OF SENSITIZATION TO POLLEN AND FUNGAL ALLERGEN EXTRACTS IN CHILDREN WITH ALLERGIC PATHOLOGY BY IMMUNOCAP METHOD

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The purpose of the study was to investigate the sensitization of children with allergic pathology to weed pollen and tree pollen, as well as fungal allergens. 220 children with various allergic diseases in the age range from 1 to 17 years were examined. Allergological examination included determination of specific IgE-antibodies in blood serum by ImmunoCAP method (pollen, fungal). Relatively high level of sensitization was noted for cypress evergreen pollen allergen (t23), sIgE level was 2.232±1.515 kU/l (2nd class). Relatively high level of fungal allergens was observed for *Alternaria alternata* allergen (m6), sIgE level was 2.358±1.215 kU/l (pF=0.912; pU=0.067) (2nd class). Among pollen allergens, sensitization to lanceolate plantain, evergreen cypress and European olive was the most frequent. Hypersensitization to antigens of *Alternaria alternata* fungus was proved by the conducted studies.

Key words: sensitization, pollen allergens, fungal allergens, children, allergic pathology, ImmunoCAP method.

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ВИЗНАЧЕННЯ ЧУТЛИВОСТІ ДО ЕКСТРАКТІВ ПИЛКУ ТА ГРИБКОВИХ АЛЕРГЕНІВ У ДІТЕЙ З АЛЕРГІЧНОЮ ПАТОЛОГІЄЮ МЕТОДОМ IMMUNOCAP

Метою дослідження було вивчення сенсibiliзації дітей з алергічною патологією до пилку бур'янів і деревних рослин, а також до грибкових алергенів. Обстежено 220 дітей з різними алергічними захворюваннями у віці від 1 до 17 років. Алергологічне обстеження включало визначення специфічних IgE-антитіл у сироватці крові методом ImmunoCAP (пилкові, грибкові). Відносно високий рівень сенсibiliзації відзначений до алергену пилку кипариса вічнозеленого (t23), рівень sIgE склав 2,232±1,515 кОд/л (2-й клас). Відносно високий рівень грибкових алергенів спостерігався для алергену *Alternaria alternata* (m6), рівень sIgE склав 2,358±1,215 кОд/л (pF=0,912; pU=0,067) (2-й клас). Серед пилкових алергенів найчастіше зустрічалася сенсibiliзація до подорожника ланцетового, кипарису вічнозеленого та оливи європейської. Проведені дослідження підтвердили наявність гіперсенсibiliзації до антигенів гриба *Alternaria alternata*.

Ключові слова: сенсibiliзація, пилкові алергени, грибкові алергени, діти, алергопатологія, метод ImmunoCAP.

Pollen is a prevalent environmental factor contributing to the onset of allergic rhinitis and represents a significant public health concern. In individuals with a predisposition to atopy, exposure to pollen initiates the release of allergic mediators – such as histamine – from the upper respiratory tract, ultimately provoking hypersensitivity reactions. Each year, pollen-induced allergic rhinitis affects