

Disclosures:

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GOSSYPIBOMA OF THE RIGHT HEMITHORAX IN CHILD

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ГОССИПИБОМА ПРАВОГО ГЕМИТОРАКСА У РЕБЕНКА

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Gossypiboma is a rare complication of surgical interventions that can have severe medical and legal consequences. We report the clinical case of a boy who was 4 years old and was operated on at 1.5 months old for atrial septal defect and partial abnormal drainage of the right pulmonary veins into the right atrium. After 3 years, a mass was found in the projection of the basal segments of the right lung. An X-ray showed signs of calcification. Thoracoscopy was performed followed by conversion to open surgery and removal of the gossypiboma with a fibrous capsule of 3×3.5×3 cm. An examination 6 months after surgery showed no complaints, and growth and development were normal according to age. The diagnosis of gossypiboma should be included when determining a diagnosis in all cases where there is a history of surgery and non-specific clinical and diagnostic manifestations.

Keywords: gossypiboma, pleural cavity, cardiac surgery, children

Госсипибома является достаточно редким осложнением после хирургического вмешательства, которое может иметь серьезные медицинские и правовые последствия. Приводится клинический случай у ребенка, 4 лет, который был оперирован в возрасте 1,5 месяцев по поводу дефекта межпредсердной перегородки и частичного anomального дренирования пра-

вых легочных вен в правое предсердие. Через 3 года обнаружено объемное образование в проекции базальных сегментов правого легкого и появление рентгеновских признаков его обызвествления. Выполнена торакоскопия с конверсией доступа с удалением госсипиомы, покрытой фиброзной капсулой размером 3х3,5х3 см. При контрольном обследовании через 8 месяцев после операции ребенок жалоб не предъявляет; растет и развивается соответственно возрасту.

Таким образом, подозрение на госсипиому необходимо включать в диагностический поиск во всех случаях, когда в анамнезе имелось оперативное вмешательство с развитием в последующем неспецифических клинико-диагностических проявлений в месте вмешательства.

Ключевые слова: госсипиома, плевральная полость, кардиохирургическая операция, дети

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СТ – computed tomography

Gossypiboma or textiloma is defined as a group of complications during surgical interventions as a result of leaving foreign bodies (e.g., gauze tissues, tampons) in various cavities of the patient's body. In 1881, Wilson first coined the term gossypiboma. The name gossypiboma comes from the Latin word *Gossypium* (cotton) and *boma* («secret shelter») in Swahili [1, 2, 3]. Gossypiboma is a rare, but serious, complication of surgical interventions, and it can have severe medical and legal consequences.

Because of the lack of awareness of specialists with this pathology and the complexity of its diagnosis, we describe a rare clinical observation of gossypiboma from our practice.

Case report. A 4-year-old boy was operated on at the age of 1.5 months for a defect in the atrial septum, partial abnormal drainage of the right pulmonary veins into the right atrium, and moderate stenosis of the left pulmonary veins. Plastic surgery of the atrial septal defect with a xenopericardial patch was performed. The abnormally draining right pulmonary veins were moved to the left atrium under conditions of cardiopulmonary bypass and hypothermia.

The postoperative period was complicated by cardiopulmonary insufficiency, pulmonary bleeding, mechanical ventilation-associated pneumonia, and encephalopathy of hypoxic and ischemic origin. The child remained in a medical institution for treatment and rehabilitation for a protracted period.

One year after surgery, computed tomography (CT) of the chest showed a volumetric formation in the projection of the basal segments of the right lung, and this was intimately associated with the mediastinum (Fig. 1A). At the same time, clinical manifestations and changes in laboratory parameters (including tumor markers) were not detected. The unfavorable general somatic state of the child (weight loss, residual effects of encephalopathy, and right-sided pneumonia), and the absence of clinical and laboratory changes were taken into account to decide how to treat the patient. A wait-and-see approach was chosen, with periodic CT examinations and analysis of laboratory parameters, including tumor markers.

The child was hospitalized 3 years after surgery as had been planned. The child had no active complaints. Weight, growth, and neurological and mental indicators were normal for age. However, according to a CT scan of chest organs, there was right-sided volumetric soft tissue formation of the middle mediastinum, which was 28×27×28 mm in size with

calcified fragments (Fig. 1B). The results of laboratory tests of blood and urine corresponded to age-related normative indicators. However, because calcification of soft tissue had been absent in previous CT scans, we decided to perform surgical intervention with suspected inflammatory infiltrates or a mediastinal dermoid cyst.

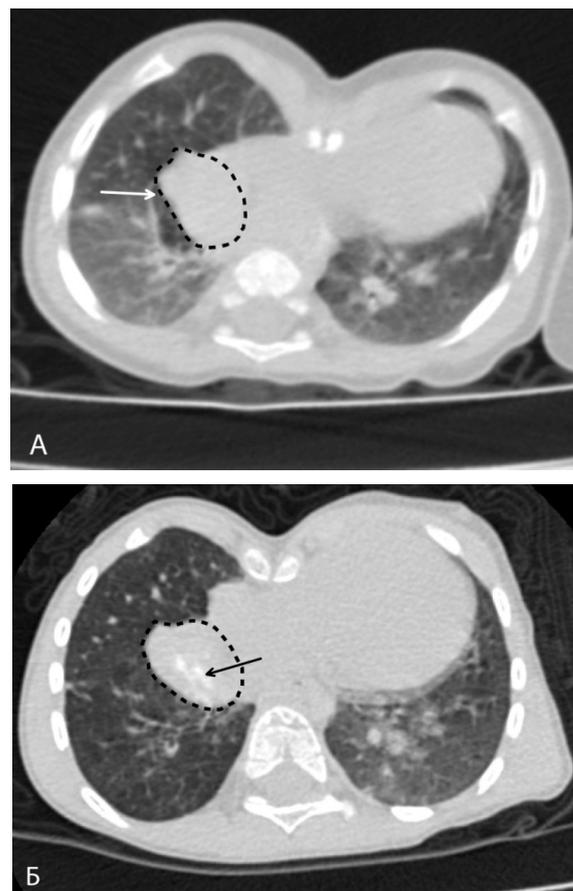


Fig. 1. CT of the chest. Axial cut: A – one year after cardiac surgery: volumetric formation in the projection of the basal segments of the right lung and middle mediastinum (white arrow); B – three years after cardiac surgery: right-sided volumetric soft tissue formation of the middle mediastinum, which was 28×27×28 mm in size with calcified fragments (black arrow)

On 21 September 2018, we performed thoracoscopy and thorotomy on the patient. Volumetric formation

was not visualized in the right pleural cavity. In the region of the basal segments of the lower lobe, there were adhesions between the pleural sheets, which were divided before diaphragmatic-mediastinal transition. However, a tumor was not identified. Further thoracoscopy was considered impractical because of the impossibility of manual contact with the tumor and we were unable to differentiate pathological tissue during thoracoscopy. Therefore, we decided on conversion to open surgery.

Posterolateral thoracotomy was performed in the fifth intercostal space on the right side. Palpation showed a mass with a dense elastic consistency, which was spherical in shape. The mass was located in the projection of the horizontal interlobar fissure and was medially attached to the mediastinum. The interlobar fissure was dissected and the upper pole of the mass was visualized. Furthermore, using blunt and sharp dissection by an ultrasonic dissector, the mass was isolated from the adhesions, cut off from the pericardium, and removed. A chest tube was inserted to achieve negative pressure. The postoperative period was uneventful. The patient was discharged home in a satisfactory condition.

An examination of the mass after surgery showed that it was round, with the dimensions of 3×3.5×3 cm, and it was covered with a dense fibrous capsule. Sections of the mass showed surgical gauze impregnated with pus exudate (Fig. 2).



Fig. 2. An examination of the mass after surgery showed that it was round, with the dimensions of 3×3.5×3 cm, and it was covered with a dense fibrous capsule. Sections of the mass showed surgical gauze impregnated with pus exudate

During a follow-up examination, 8 months after the operation, there were no complaints and the child grew and developed normally. Clinical and biochemical blood parameters were normal for the child's age. Radiographs of the chest organs did not show any infiltrative and volumetric pathological formations, and there was no reaction from the pleura (Fig. 3).

Discussion. The most frequent localization of gossypibomas is the abdominal cavity (56 %), followed by the pelvis (18 %) and the chest (11 %) [4, 5]. A foreign body left in the process of cardiac surgery is rare. However, gossypibomas have a higher frequency during surgical interventions on the lungs and organs of the mediastinum. The frequency of this pathology is one case per 1000–10000 operations. Gossypibomas are usually detected 6–9 years after surgery [6]. However, these data do not reflect the real extent of the problem because doctors often conceal information about such cases.

In our case, we refrained from operating with first detection of a mass in the chest because of the unstable somatic status of the child who had previously undergone

radical surgery with severe postoperative complications. At the time of the first treatment, the child had a low body weight and a delay in psychomotor development, but without specific clinical manifestations associated with a tumor. These circumstances forced us to operate 3 years after the first CT scan. By this time, the child had a normal growth-weight index and neuropsychiatric status corresponding to children of his age.

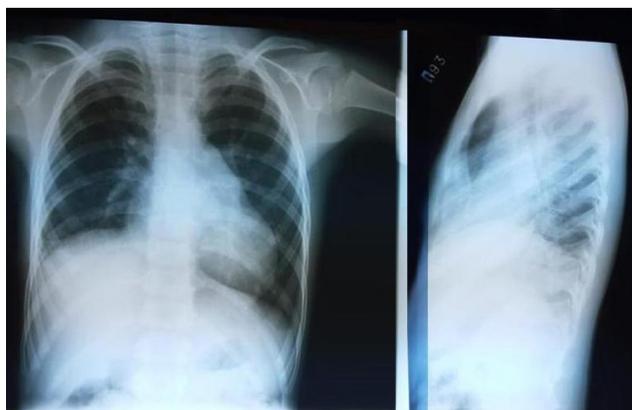


Fig. 3. Chest x-ray in two projections (8 months after surgery). There were no infiltrative and volumetric pathological formations; there was no reaction from the pleura

Reaction of an organism to a foreign body can occur in two ways. The first is aseptic granulomatous inflammation and the second is formation of an abscess [1]. Therefore, gossypibomas pose a significant problem in association with development of complications, such as abscesses, fistulas, perforations, adhesions, and migration to various organs. Clinical manifestations are diverse and depend on the localization of a foreign body. When a gossypiboma is located in the chest, the following symptoms are characteristic: cough, shortness of breath, pain, fever, and a sensation of volumetric formation. However, in some cases, gossypiboma may be asymptomatic for years.

Laboratory and imaging diagnosis of gossypiboma are relatively complicated. Among laboratory features, only non-specific features are found, such as an increase in the erythrocyte sedimentation rate and neutrophilic leukocytosis [1]. Among imaging studies, ultrasound, radiography, CT, and magnetic resonance imaging are most often used. The method of choice for diagnosing gossypibomas and their complications is CT [7]. Specific signs of a gossypiboma on CT are as follows: a heterogeneous low-density mass with precise contours or an external high-density capsule, and the image itself has a spongy appearance. Another specific feature is formation of air bubbles in the structure [1, 3, 4, 5]. However, air bubbles are only observed in the early postoperative period. Additionally, with intrapleural localization of gossypibomas, gas bubbles may not even be present in the early period because of their resorption by the pleura [2, 8]. In our case, CT signs were volumetric, soft-tissue, contrast-negative formation of a round shape, with smooth contours, and an inhomogeneous structure due to layered high-density inclusions.

If X-ray contrast labels are not used for marking surgical gauze and hemostatic sponges, radiological methods of investigation in most cases turn out to be uninformative for diagnosing gossypiboma because of a lack of characteristic signs. Therefore, radiological signs

of gossypiboma can imitate a hamartoma, teratoma, abscess, and tumor neoplasm [1, 4, 7, 9].

Diagnosis with differentiation between neoplasms and gossypibomas is relatively complicated, especially in the late postoperative period, when characteristic signs of a gossypiboma disappear [10]. The difficulty lies in the similarity of CT images showing soft tissue formation with a heterogeneous structure. In this case, the characteristic clinical presentation of some tumors, tumor markers, and a biopsy helps with a correct diagnosis.

Conclusions. The difficulties in diagnosing a gossypiboma are its rarity and low awareness of

doctors in relation to this pathology. Other problems include the absence of specific clinical and laboratory signs, especially in the late postoperative period. The diagnosis of a gossypiboma should always be included in a differential diagnosis if a patient with nonspecific clinical and imaging data has a history of surgery [11]. To avoid such cases, all surgical materials used during surgery should be counted during the surgical procedure. The use of radiopaque tags integrated into surgical wipes and hemostatic sponges should be considered.

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