

**METOD OF CLOSURE OF THE FIBROTIC CAPSULE IN GIANT LUNG HYDATID CYSTS:
SELF-EXPERIENCE STUDY.**

Ivan P. Novakov

Department of Special Surgery; Medical University – Plovdiv

Abstract.

Background.

Surgery is the cornerstone in management of pulmonary hydatid cysts and aims to remove hydatid cysts and obliterate the residual fibrotic cavity. Several methods are used to close the fibrotic cavity.

The aim of this publication is to present a method that we use for closing the fibrotic cavity in giant lung hydatid cysts.

Method. Giant lung hydatid cysts are considered cysts with the size more than half of a hemithorax. On the base of our experience, to close the fibrotic cavity in cases with giant lung hydatid cysts, we routinely use interrupted non-absorbable sutures, putting one above the other - from the base of the fibrotic cavity up to the surface of the lung. We don't compare the presenting method with the others used in surgery of lung echinococcosis.

Conclusion. According to our experience, closure the fibrotic cavity with interrupted sutures leads to good anatomical results in a surgery treatment of giant lung echinococcosis.

key words: *giant lung hydatid cysts, fibrotic capsule, interrupted sutures.*

address for correspondence: inovakov2003@yahoo.com

Introduction.

Surgery is the cornerstone of management of pulmonary hydatid cysts and aims to remove hydatid cysts or its remnants and obliterate the residual cavity. Different surgical techniques can be applied to deal with the pericystic layer and the cyst cavity depending on the extent of the pericystic layer, the cavity size and depth - excision of entire cyst by enucleation, excision of pericyst, cystotomy, capitonnage, wedge resection, segmentectomy and lobectomy. Even though, there are many reports that include video-assisted thoracic surgery among the surgical procedures for lung echinococcosis (1,2,7,8,9).

Criteria for selecting operative technique differ from one country to another and are closely related to experience with disease and the condition of the cyst. The choice of surgical technique also depends on the conditions encountered during surgery and finally is the decision of each thoracic surgeon to perform the procedure considered to be most appropriate at the time of surgery (1,3,8,9,10).

The aim of this publication is to present the method that we use for closing the fibrotic cavity especially in giant lung hydatid cysts.

Description of the method.

All cases with giant lung hydatid cysts (with the size more than half of a hemithorax – fig. 1). we operate by lateral thoracotomy, under general anesthesia with a double lumen endotracheal tube. After entering the hemithorax, the lung was spared from adhesions of chest wall and then cysts were identified and surrounded by packs soaked with 5% povidone iodine to prevent seeding of possible ruptured laminated membrane.

An 18-Gauge needle connected to 30ml syringe is inserted in the upper most part of the cyst and the fluid is completely aspirated (in case complicated with bronchial perforation this step of operation isn't performed). We never inject scolicial agent into the cyst cavity.



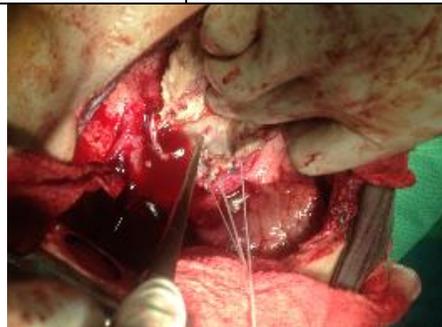
Figure 1. Chest X-ray demonstrates a giant right-sided lung hydatid cyst, complicated with bronchial rupture.



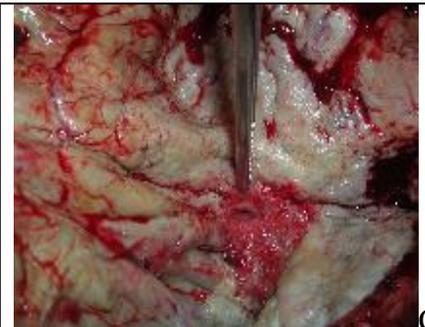
Figure 2. Opening the fibrotic capsule by, with electrocautery, so that the germinative membrane is visible.



A.



B



C

Figure 3. Germinative membrane is taken out (A), the part of the pericyst that protruded outside the lung parenchyma is excised (B) and one bronchial opening is shown (C).

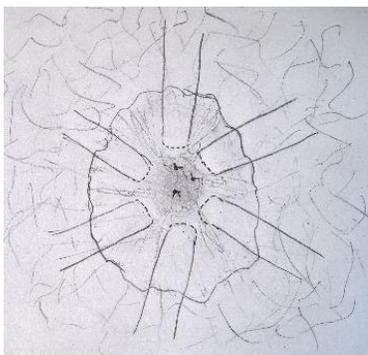


Figure 4. The graphic shows the placed first order of interrupted sutures and closing of the three bronchial openings.



Figure 5. Healthy edges of the incised lung parenchyma are re-approximated with non-absorbable interrupted stitches.

Insertion site is enlarged by cutting the pericystic layer (fibrotic capsule) with electrocautery, so that the germinative membrane is easily taken out (fig. 2, fig. 3A). After the removal of the germinative layer, the fibrotic cavity is carefully cleaned by a suction apparatus and irrigated with 1 % povidone – iodine. The part of the pericyst that protruded outside the lung parenchyma is excised. Bronchial openings are identified using intrapulmonary positive pressure maneuver and irrigation of saline into the cystic cavity and are closed by 3/0 silk sutures (fig. 3B, 3C).

After suturing the bronchial openings, we closure the fibrotic capsule by interrupted silk sutures. The sutures are placed and tight in orders one above the other, from the depth of the capsule to the superficial layer (surface of the lung) / (fig. 4).

Minor parenchymal air leaks on the edges of the incised lung parenchyma are also sutured. and finally the healthy edges of the incised lung parenchyma are re-approximated with non-absorbable interrupted stitches / (fig. 4, fig. 5). After insertion of one or two chest tubes (30 or 32 French sizes) in the pleural cavity, the chest is closed using classic approach.

Discussion.

Pulmonary cysts may range between 1 and more than 20 cm in diameter. “Giant lung hydatid cyst” as a term is accepted to notice the cyst with the size more than half of a affected hemithorax (1,5,6,9). Large cysts can shift the mediastinum, induce a pleural reaction or cause atelectasis of adjacent parenchyma (4,7,8,9).

Even though there are published data for using the thoracoscopic surgery, the method of choice in the treatment of giant lung hydatid cyst is conventional surgery (by thoracotomy) / (1,8,9,10).

The primary objective of the surgery is to evacuate endocyst and its contents in toto. The cure rate and recurrence rate depend on extent of removal of cyst and its contents. There is a consensus that pericyst is generated in response to host response and need not essentially removed. The closure of bronchial openings within the residual cyst cavity and management of the residual cavity itself is important in order to prevent prolonged post-operative air leak and empyema formation. The lung parenchyma should be preserved as far as possible especially in children and endemic areas, where risk of recurrence is a real concern. In complicated cysts resection may offer low post-operative morbidity in contrast to conservative surgery but case selection remains challenging (1-10).

The method of surgery that we presented consists of: cystostomy, closure of the bronchial openings and capitonnage. This method, known like Posada’s technique, had described and published in 1952 year and is successfully used nowadays in the surgery of lung echinococcosis. Many authors don’t perform puncture of the cyst. They advocate the maneuver of removing the intact endocyst with the aim to prevent spillage of the cyst contents. According to us, this maneuver isn’t suitable in giant cyst because of very high risk of rupture the endocyst with spillage of the cyst contents.

Large hydatide cysts compress the adjacent lung parenchyma and bronchial walls, because of that in almost every case with a giant cyst there are bronchial openings, some of them well-expressed. Because of that, we always carefully find bronchial openings and closure them with non-absorbable silk sutures.

There are two options in the management of pericystic capsule (fibrotic capsule) – to leave the cavity open after closure of the bronchial openings (uncapitonnage method) and in the contrast is the capitonnage method – to obliterate the fibrotic capsule by imbrications sutures from deep to superficial layers. In giant hydatid cyst of the lung we always use the capitonnage method. In our practice we established that closure of the fibrotic capsule reduces risk of the infection of residual cavity, airway leak and empyema formation. This maneuver leads to excellent post-operative outcome.

The french surgeon Delbet first described and published the method called capitonnage, which is the folding of the pericystic zone by sutures. Delbet closed the fibrotic capsule by circular imbrications sutures from deep to superficial layers (1,2,8,9).The opponents of Delbet present the demerits of the capitonnage - disfigurement of the lung parenchyma leading to prolonged atelectasis (1,2,4). We advocate the capitonnage of the fibrotic capsule in giant hydatid lung cysts, but with the purpose to minimize the risk of disfigurement of the lung parenchyma we don't used uninterrupted circular sutures. In our practice, we closure the fibrotic capsule with interrupted sutures, placed and tied in orders from the base of the capsule up to the lung surface, with excellent postoperative anatomical result (without high risk of disfigurement of the lung parenchyma), established on the postoperative controlled thoracic X-rays.

Conclusion.

We present the surgical method, used by us in the treatment of the giant lung hydatid cysts. According to our experience, capitonnage by interrupted silk sutures leads to good anatomical results in a surgery treatment of giant lung echinococcosis.

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