

Common pleural cavity in combination with *pectus excavatum*

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Key words: common pleural cavity, pleura, *pectus excavatum*.

Summary. A very rare case is being described; common pleural cavity was accidentally diagnosed in a 3-year-old boy operated for funnel chest (*pectus excavatum*). During 36 years 516 patients were operated in our department and we often notice *pectus excavatum* associated with other types of congenital pathology but only one had the common pleural space. In normal human beings pleural space is divided into left and right chambers separated by the mediastinum with no communication in between. In some mammals such as pigs, cows etc. a congenital communication is found between the pleural cavities, but this type of communication is very rare in humans and most often is of acquired origin. Pleural communication may also develop after major cardiothoracic surgery. In this case a 3-year-old male patient was admitted for the elective surgery on *pectus excavatum*. Clinical examination showed a very deep funnel chest. Both the heart and the mediastinum are left-shifted by the deformed breastbone; it is clearly demonstrated on a plain and lateral X-ray. On the left, beside the main vessels, an indistinct patch is noted. Typical M. Ravitch procedure was performed, by accident the pleural space was opened. Both pleural cavities had an evident communication along the anterior mediastinum. The torn pleura was sutured, the excess air removed by a puncture. Postoperative period was uneventful, additional treatment was not needed; currently the boy is feeling well. The postoperative X-ray showed the heart and the mediastinum to return to normal position.

Introduction

In normal human beings pleural space is divided into left and right chambers separated by the mediastinum with no communication in between (1). In some mammals such as pigs, cows etc. a congenital communication is found between the pleural cavities. This type of communication is very rare in humans and most often is of acquired origin. There are only a few scientific reports on common pleural cavity indicating that it mostly occurs after complex cardiothoracic surgery, while both cavities are opened (operations on combined cardiac and main vessels defects, heart transplantation, and heart-lungs transplantation) (2, 3). In this report we present a rare clinical case when a 3-year-old boy was accidentally diagnosed with common pleural cavity during the operation on *pectus excavatum*.

Case report

A 3-year-old male patient A. P. was admitted for the elective surgery on *pectus excavatum*. Clinical examination showed a very deep funnel chest, pro-

truding ribs' cage, bulging abdomen and paradoxical breathing (Fig. 1). Both the heart and the mediastinum were left-shifted by the deformed breastbone; it is clearly demonstrated on a plain X-ray. On the left, beside the main vessels, a suspicious patch was noted (Fig. 2). A lateral X-ray revealed a deep depression of the breastbone pressing the heart towards the spine. The sternovertebral distance at the deepest point of depression was only 3.8 cm and airiness of the lungs is increased (Fig. 3). The boy underwent elective surgery, typical M. Ravitch procedure was performed. When the xiphoid process was being separated from the sternum body, the pleural space was opened by accident. Both lungs and the heart were seen through the tear. Both pleural cavities had an evident communication along the anterior mediastinum. The sternochondroplasty was successfully performed; the corrected sternum was fixed under external traction. The torn pleura was sutured, the excess air was removed by a puncture. Postoperative period was uneventful. The traction threads were removed and two-direction chest X-rays were performed in 1 month



Fig. 1. Patient A. P. with pectus excavatum and common pleura

after surgery. The plain X-ray showed the heart and the mediastinum returned to the normal position, but the indistinct patch was still present in the mediastinum (Fig. 4). From the left lateral picture it is clear that the former deformity was corrected, the sternovertebral distance increased up to 7 cm, but there were still some signs of increased airiness right behind the breastbone.

Discussion

This rare case demonstrates that separate pleural spaces may have the inborn communication and this may be considered as a variety of normal. This phenomenon is rarely described in the scientific literature because usually it is discovered accidentally during the thoracic surgery performed for various causes or it becomes evident in case of complications such as pneumothorax, hydrothorax or pyothorax. Pleural communication may also develop after major cardiothoracic



Fig. 2. Straight X-ray film before operation



Fig. 3. Left side X-ray film of chest before operation

surgery (operations on combined cardiac and main vessels defects, heart transplantation, heart-lungs transplantation) (2, 3). Some cases of bilateral pneumothorax that occurred after unilateral procedures such as percutaneous needle biopsies (4, 5) are described, although in Jensen's case the bilateral pneumothorax developed due to the contralateral lung prolapse and contemporary perforation of both pleurae.

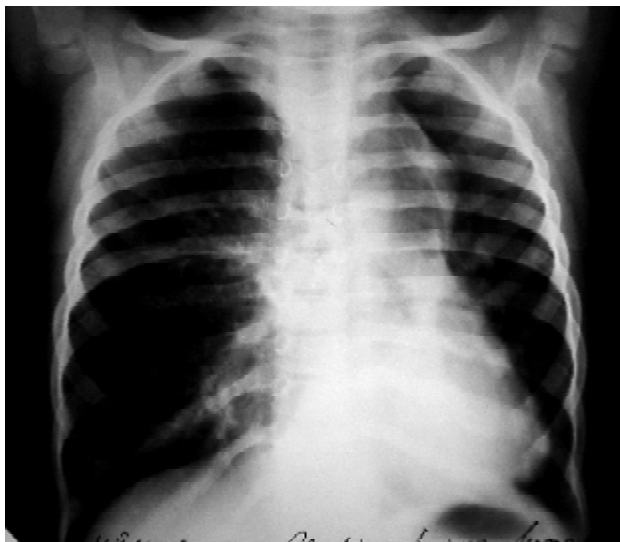


Fig. 4. Straight X-ray film of chest after operation

A true communication between the pleural cavities so common for some mammals (pigs, cows) is very rare among the human beings. Most likely those are very small junctions at the sites of natural fusion. Pus or fluid could easily pass through those persistent junctions (1). The size of those communications usually remains undetermined because the defects are discovered only in presence of bilateral complications after unilateral intervention (drainage, puncture). For this reason the precise incidence of this anomaly is unknown, while the sporadic cases are rarely reported.

In our case the persistent communication was discovered during the operation therefore it was easy to evaluate its size. During 36 years 516 patients were operated in our department for pectus excavatum but only one had the common pleural space. The boy is



Fig. 5. Left side X-ray film of chest after operation

feeling well. In our practice we often notice pectus excavatum associated with other types of congenital pathology (Marfan's syndrome, congenital tracheomalacia) but this cannot lead to the conclusion that the patients with pectus excavatus more often present with common pleural space since there is no evidence. We can only state that a combination of congenital pectus excavatum with common pleural space is possible.

Bendra pleuros ertmė nustatyta berniukui, kuriam buvo įdubusi krūtinė (*pectus excavatum*)

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Raktažodžiai: bendra pleura, pleura, pectus excavatum.

Santrauka. Straipsnyje aprašomas labai retas klinikinis atvejis – bendra pleuros ertmė, kuri diagnozuota atsitiktinai, operuojant trejų metų berniuką dėl įdubusios krūtinės. Kauno medicinos universiteto klinikų Vaikų chirurgijos klinikoje per 36 metus dėl įdubusios krūtinės operuota 516 vaikų. Gana dažnas įdubusios krūtinės ir kitos įgimtos patologijos derinys, bet tik vienu atveju rasta bendra pleura.

Normaliai žmogaus kairė ir dešinė pleuros ertmės yra atskirtos tarpuplaučio ir tarpusavyje nesusisiekia. Kai kurie žinduoliai (kiaulės, karvės ir kt.) turi įgimtą jungtį tarp pleuros ertmių, bet žmonėms tokia jungtis randama

ypač retai, ir tai dažniausiai būna ne įgimta, o įgyta. Dažniausiai tai jatrogeninė bendra pleuros ertmė, susiformavusi po sudėtingų krūtinės ląstos operacijų.

Taigi trejų metų normaliai augusį ir normalios raidos berniuką konsultavo vaikų chirurgas dėl įgimtos įdubusios krūtinės ląstos. Diagnozuota labai gili simetrinė krūtinkaulio įduba. Krūtinės ląstos tiesinėje ir šoninėje rentgenogramose matomas įdubusio krūtinkaulio į kairę gerokai dislokuotas tarpuplautis ir širdis. Be to, šalia stambiųjų kraujagyslių šešėlio matomas neaiškus papildomas šešėlis. Diagnozavus įdubusią krūtinę ir atliekant M. Ravitch sternochondroplastiką, atsitiktinai atverta pleuros ertmė. Pastebėta, kad abi pleuros ertmės susiekia per visą tarpuplaučio ilgį. Plyšęs pleuros lapelis susiūtas, oras iš pleuros pašalintas punkcija. Pooperacinis laikotarpis sklandus, jokio tolesnio gydymo nereikėjo. Šiuo metu berniukas jaučiasi sveikas. Atliktose kontrolinėse krūtinės ląstos rentgenogramose matoma krūtinkaulio deformacija koreguota, tarpuplautis ir širdis normalioje padėtyje.

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