

SURGERY OF CONGENITAL BRONCHECTASES IN CHILDREN AND ADULTS

Shirtaev B.K., Sundetov M.M., Yerimova N.Zh., Bogdanova D.O., Mukashev S.E.

“A.N. Syzganov National Scientific Center for Surgery”, JSC, Almaty, Kazakhstan

Abstract

The overwhelming majority of thoracic and pediatric surgeons are of the opinion that it is necessary to perform early surgeries for congenital bronchiectasis, since bronchial dilatation leads to infection of bronchial contents and repeated exacerbations of the inflammatory process, but some pediatricians express a reserved attitude to operations in childhood, adhering to long-term follow-up tactics.

Purpose. To present statistical data on the situation of patients with congenital bronchiectasis of different age categories and to offer separate recommendations for the treatment and diagnosis of patients with congenital bronchiectasis.

Material and methods. 433 patients with congenital bronchiectasis were operated in our clinic, which was 50.9% of all congenital lung malformations. The patients' age ranged from 2 to 65 years. There were more children and adolescents (60.9%) than adults (39.1%).

Results. The article presents the results of diagnostics and surgical treatment of 433 patients with congenital bronchiectasis. It was found that the immediate and long-term results of surgical treatment of children are better than those of adult patients.

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Shirtaev B.K.
orcid.org/0000-0002-0773-3878
Sundetov M.M.
orcid.org/0000-0002-0387-5422
Yerimova N.Zh.
orcid.org/0000-0002-0565-5327
Bogdanova D.O.
orcid.org/0000-0003-0398-5813
Mukashev S.E.
orcid.org/0000-0003-3022-1093

Corresponding author.

Yerimova N.Zh. – MD, pediatrician,
“A.N. Syzganov National Scientific
Center for Surgery” JSC, Almaty,
Kazakhstan
E-mail: nazier1611@gmail.com

Conflict of interest

The authors declare that they have no conflicts of interest

Keywords:

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Балалар мен ересек науқастардың туа пайда болған бронхоэктазының хирургиясы

Ширтаев Б.К., Сундетов М.М., Еримова Н.Ж., Богданова Д.О., Мукашев С.Е.

«А.Н. Сызғанов атындағы Ұлттық ғылыми хирургия орталығы» АҚ, Алматы қ.,
Қазақстан

Аңдатпа

Кеуде және балалар хирургтері туа біткен бронхоэктаз кезінде операцияны ерте жасауды ұсынады, себебі бронхтардың кеңеюі бронхиалды құрамның инфицирленуіне және қабыну процесінің қайтадан өршуіне әкеледі, бірақ кейбір педиатрлар балалық шақта операция жасауға басқа көзқараспен қарайды, яғни ұзақ уақыт динамикада бақылауды жөн көреді.

Мақсаты. Әртүрлі жастағы категориядағы туа біткен науқастар бойынша статистика жүргізу, туа біткен бронхоэктаздың диагностикасы мен емі бойынша өзге нұсқаулықтарды ұсыну болып табылады.

Материал және әдістер. Біздің клиникада 433 науқасқа туа біткен бронхоэктаз бойынша операция жасалынды, барлық туа біткен өкпенің ақауларының 50,9%-ды құрады. Науқастардың жасы 2 мен 65 жас аралығында болды. Балалар мен жасөспірімдер (60,9%) ересектерден (39,1%) көп болды.

Нәтижелер. Басылымда туа біткен бронхоэктазы бар 433 науқастың диагностикасы мен хирургиялық емінң нәтижесі көрсетілген. Ересектерге қарағанда балалардағы хирургиялық емнің нәтижесі оңтайлырақ.

Хат алысатын автор.

Еримова Н.Ж. – Дәрігер-педиатр,
«А.Н. Сызғанов атындағы Ұлттық
ғылыми хирургия орталығы» АҚ,
Алматы қ., Қазақстан
E-mail: nazier1611@gmail.com

Мүдделер қақтығысы

Авторлар мүдделер қақтығысы туралы мәлімдеме жасаған жоқ

Түйін сөздер:

туа біткен бронхоэктаз, бронх,
ремиссия кезеңі, өкпе резекциясы.

Хирургия врожденных бронхоэктазов у детей и взрослых больных

Ширтаев Б.К., Сундетов М.М., Еримова Н.Ж., Богданова Д.О., Мукашев С.Е.

АО «Национальный научный центр хирургии им. А.Н. Сызганова», г. Алматы,
Казахстан

Аннотация

Подавляющее большинство торакальных и детских хирургов высказывают мнение о необходимости раннего выполнения операций при врожденных бронхоэктазах, так как расширение бронхов приводит к инфицированию бронхиального содержимого и повторным обострениям воспалительного процесса,

Автор для корреспонденции.

Еримова Н.Ж. – Врач-педиатр,
АО «Национальный научный центр
хирургии им. А.Н. Сызганова»,
г. Алматы, Казахстан
E-mail: nazier1611@gmail.com

Конфликт интересов

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но часть педиатров выражают сдержанное отношение к проведению операций в детском возрасте, придерживаясь тактики длительного динамического наблюдения.

Цель. Представить статистические данные о положении больных с врожденными бронхоэктазами разных возрастных категорий и предложить отдельные рекомендации по лечению и диагностике больных с врожденными бронхоэктазами.

Материал и методы. В нашей клинике прооперировано 433 больных с врожденными бронхоэктазами, что составило 50,9% среди всех врожденных пороков развития легких. Возраст больных колебался от 2 до 65 лет. Детей и подростков (60,9%) было больше чем взрослых (39,1%).

Результаты. В статье представлены результаты диагностики и хирургического лечения 433 больных с врожденными бронхоэктазами. Установлено, что ближайшие и отдаленные результаты оперативного лечения детей лучше, чем у взрослых больных.

Ключевые слова:

врожденные бронхоэктазы, бронхи, период ремиссии, резекции легких

Congenital bronchiectasis relate to birth defects and formed by a series of pre-and postnatal developmental defects of the tracheobronchial system. Thoracic surgeons have expressed opinion about the necessity of early surgery on children, because congenital bronchial dilation leads to infection of the bronchial contents and re-aggravation of the inflammatory process [1, 2, 3, 4]. But some pediatricians have the reserved attitude towards surgery in children, adhering to long-term follow tactics for sick children and re-examinations to decide of necessity of surgical intervention [5, 6]. Over the last 25 years in our clinic operated 433 patients with congenital bronchiectasis. This constituted 50.9% of all operated patients with congenital lung disease in the same period. The age of patients ranged from 2 to 65 years. Children and adolescents (60,9%) was more than adults (39,1%).

For examination of patients used chest radiography, CT scan of the lungs, bronchography, bronchoscopy, spirometry, lung scintigraphy and angiopulmonography. In all cases of congenital bronchiectasis were confirmed by postoperative pathologic studies.

In 2.1% of cases the disease was asymptomatic and detected at routine radiological surveys. The first symptoms of disease in the majority patients (72.7%)

from early childhood were persistent cough with mucous and purulent sputum, intermittent fever, malaise and weakness. Diagnostic bronchoscopy observed a direct correlation between the volume of anatomical changes in the bronchi, the nature and prevalence of inflammatory changes.

Computed tomography was performed on 132 patients with suspected congenital bronchiectasis. Verification was carried out according to bronchography and surgical intervention. Bronchiectasis were detected in 78 patients. Sensitivity of computed tomography in diagnosis of bronchiectasis was 93.6% and specificity - 88.8%. Thus, computed tomography allows to establish the localization of bronchiectasis, their prevalence and to identify the volume of surgery without invasive procedures.

Bronchographic studies have shown that most congenital bronchiectasis was localized in the left lung - 66,7%. The most common combination was congenital bronchiectasis of the lower lobe with lingula or with middle lobe, and most rare - a combination of lesions of the upper and middle lobes. Bilateral lung involvement was detected in 22.4% of patients, the most frequent combinations were bronchiectasis of the lower and the middle lobe (Fig. 1).

Figure 1.
Bronchography.
Bronchiectasis of the lower
lobe of the left lung



Objective information about the state of the pulmonary capillary blood flow gives scintigraphy. Were examined 67 patients. In assessing the scintigraphic data in 33 (49.3%) patients found a decrease in accumulation of the radiopharmaceutical in the form of focal changes with rounded shape, lung picture was deformed. In 34 (50.7%) patients noted a sharp decline in the alveolar-capillary blood flow up to its complete absence in pathological areas of the lung tissue.

Angiopulmonography showed complete absence of contrast in the affected part of the lung in 8 (12.5%) patients. During angiopulmonography determined pulmonary artery pressure. In all patients, regardless

of the prevalence of bronchiectasis, pulmonary artery pressure was within the normal range (average dynamic blood pressure below 20 mm Hg).

Almost all patients were operated in the period of remission. Volume and character of surgical interventions are presented in Table 1. The most commonly performed lower lobectomy (35.1%), extirpation of bronchi (22.2%) and combined resection (17.6%). Surgery on left lung were performed in more than 1.5 times more often. In children and adults surgery technique were similar, except staged bilateral lung resections, which performed more in adults (3.4% vs. 10.0%).

Type of surgery	Children	%	Adults	%	Total	%
Pneumonectomy	2	0,8	2	1,2	4	0,9
Bilobectomy	13	4,9	14	8,3	27	6,2
Lobectomy						
upper	1	0,4			1	0,2
middle	24	9,1	15	8,9	39	9,0
lower	96	36,4	56	33,1	152	35,1
Combined resection	53	20,1	23	13,6	76	17,6
Segmental resection	8	3,0	4	2,4	12	2,8
Extirpation of bronchi	58	21,9	38	22,5	96	22,2
Staged bilateral lung resection	9	3,4	17	10,0	26	6,0
Total	264	100	169	100	433	100

Table 1. Character of surgical interventions in patients with congenital bronchiectasis

In determining the most appropriate surgical tactics is striving for maximum removal of the affected part of the lung which irreversibly lost its function, and at the same time striving for maximum preservation of unaltered lung tissue [7]. Therefore, while maintaining

the airiness and blood flow in the localization of bronchiectasis, we often used the method of extirpation altered bronchus in children (21.9%), and adults (22.5%) (Fig. 2).

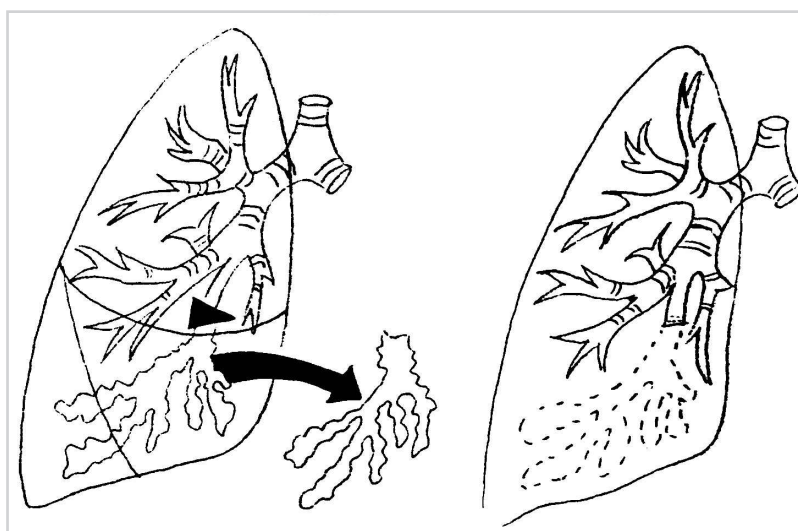


Figure 2. Scheme of extirpation of bronchi in congenital bronchiectasis

Adult patients have a longer history of the disease, so they are more likely (to 84.1%) have a dense and extensive adhesions in the pleural cavity. This leads to

an increase traumatism and duration of the operation that extends the postoperative period. The frequency of early postoperative complications in children was

10.6%, and in adults reached to 20.7%. The most frequent complications in the operated children were intrapleural bleeding (2.65%) and atelectasis (2.65%) of the operated lung lobe. In adults more commonly found bronchial fistulas (4.1%). Early postoperative complications occurred more often combined lung resections (53.6%), lobectomy (25.0%) and the extirpation of the bronchi (10.7%), which coincides with the frequency of their performance.

In the long-term period from 1 year to 22 years were examined 190 operated patients. Good long-term results were evaluated with the full recovery and full ability to work, absence of cough, acute inflammation (bronchitis, pneumonia), normal or near-normal indicators of external respiration (VC, FVC, MVL), absence of inflammatory changes during bronchoscopy and pathological changes in X-ray studies and bronchoscopy.

The survey results are presented in Table 2.

Long-term results	Good results		Satisfactory results		Unsatisfactory results	
	Children	Adults	Children	Adults	Children	Adults
Age number	60	46	13	19	21	31
%	63,8%	47,9%	13,8%	19,8%	22,4%	32,3%
P	<0,05		>0,05		>0,05	

Table 2.
Character of long-term results in operated patients

Good results (practical recovery) were observed in 63.8% of children, which is significantly higher than the results of surgical treatment of adult patients ($P < 0,05$). All unsatisfactory results observed in patients with bilateral lesions and residual bronchiectasis in the operated lung.

Under satisfactory long-term results, we realized a state of patients with persistent improvement of general condition, but with occasional cough with mucopurulent or purulent sputum, exacerbation of inflammatory diseases (bronchitis, pneumonia), which were no more than once a year. External breathing parameters may be reduced to 60% and bronchoscopy mainly limited endobronchitis different characteristics.

Unsatisfactory postoperative results were evaluated when the inflammatory process has progressed in the bronchopulmonary system: the presence of persistent cough with purulent sputum, and frequent pneumonia (more than 2 times per year). Usually the presence of varying degrees of disability. External breathing parameters, less than 60%. At bronchoscopy widespread or diffuse purulent endobronchitis, and bronchograms residual or recurrent presence of bronchiectasis.

Conclusion

For early diagnosis of congenital bronchiectasis need a comprehensive examination, the active use of such highly informative and non-invasive methods, such as computer tomography. Examination of the patients in the long term showed that timely diagnosis and early surgery reduces the risk of postoperative complications and improves long-term results.

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