



Figure 2. Anatomic peculiarities of extrahepatic bile ducts. Short left hepatic bile duct and wide bifurcation.

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UDC 616.24-002.592(1-17)

### **Distinctive features in morphogenesis of pulmonary tuberculomas in patients from non-aboriginal population of the Extreme North**

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For a decade (1997-2007), morphogenesis features of different types of tuberculomas were studied in 125 non-aboriginal patients living in the environmental conditions of the Extreme North. The study showed that morphogenesis of tuberculoma in non-aboriginal patients started more often as a result of specific alterations following lymphohematogenous tuberculosis ( $72.9 \pm 3.2\%$ ;  $p < 0.01$ ). Interestingly, tuberculous alterations in the lungs developed amid unaltered lung tissue. As a rule, formation of tuberculomas in patients from non-aboriginal population is not associated with the development of marked fibrosis of lung tissue. These distinctive features of tuberculoma formation were determined by predomination of the processes of healing and alveolar epithelium renewal over inflammatory changes, thanks to which a better repair of the structure of lung parenchyma could be attained in the end.

**Keywords:** morphogenesis, clinical course, pulmonary tuberculoma, Extreme North.

**Introduction.** One of the reasons for contradictory opinions concerning approaches to treatment of patients with tuberculomas is that decisions in deciding this question are made with the lack of attention to existing individual variants of pathogenesis and morphology seen in tuberculoma development. But in fact, different pathogenesis variants of tuberculomas remain complex and poorly explored forms of pulmonary tuberculosis. In particular, it still remains undetermined how changes in epidemiological situation and distinct features of the tuberculosis clinical course influence the eventual morphogenesis variants in different types of pulmonary tuberculomas [1].

Since the publication of a classic work by Professor M.M. Aberbakh (1969) published more than 40 years ago, fundamental studies on pulmonary tuberculomas have seldom been reported in the literature [5]. This and the motives explained above are one of the reasons to study the distinctive features observed in pathogenesis variants of tuberculoma development under environmental and socioepidemiological conditions of an Extreme-North region, which has already become a recognized problem area in phthisiatry with important consequences to the ongoing quest for novel approaches to treatment of patients.

**The aim of the study** was to explore morphogenesis features of different types of lung tuberculomas in non-aboriginal population living in the environmental conditions of the Extreme North.

**Materials and methods.** For a decade (1997-2007), morphogenesis features of different types of tuberculomas were studied by analyzing trends in clinical and radiological data coupled with morphological confirmation of distal caseous foci, in 125 non-aboriginal patients living in the environmental conditions of the Extreme North. There were 90 men (72.0%) and 35 women (28.0%), with a predomination of middle-aged (62.0%) and young (34.0%) patients.

**Results and discussion.** 177 caseous foci were resected in 125 non-aboriginal patients. Of these 125, in 108 patients ( $86.4 \pm 3.1\%$ ;  $p < 0.01$ ) tuberculoma formed originating from a tuberculous infiltrate, that often occupied an entire lung lobe. The inflammatory process was mostly characterized by exudation with a tendency towards progression of tuberculosis. On the other hand, exudative course of tuberculosis in non-aboriginal patients relatively quickly transformed to productive inflammation accompanied by the repair of anatomic and functional structure of lung tissue, which eventually favored the formation of a tuberculoma without markedly expressed fibrosis.

Clinical and morphological examinations showed that in 119 non-aboriginal patients (75.3%), morphogenesis of a homogeneous type of tuberculoma unfolded via resorption, encapsulation and consolidation of the infiltrate that previously developed as a result of lymphohematogenous tuberculosis (Table 1).

Morphogenesis of a homogeneous type of tuberculoma was preceded by recurrence of fresh confluent tuberculous infiltrates amid unaffected lung. The infiltrates were predominantly ( $95.2 \pm 3.2\%$ ;  $p < 0.001$ ) multiple bilateral, and located in the upper parts of the lung. Along with gradual increase of inflammatory process, extensive specific alterations with caseous necrotic foci developed on site of small infiltrates. Tuberculomas formed as a result of resorption of the infiltrate and a reparatory process around caseous necrosis. In most cases ( $75.2 \pm 2.9$ ;  $p < 0.01$ ), no marked concurrent fibrosis of lung tissue or pleura was observed during formation of homogeneous tuberculomas.

Morphological examinations have shown, that in 112 patients ( $89.6 \pm 3.2\%$ ;  $p < 0.001$ ), formation of tuberculomas was accompanied by predomination of processes of healing and alveolar epithelium renewal, resulting from reduced necrobiotic events, edema, and fibrin exudation in tuberculous inflammation foci, which favored the complete repair of lung parenchyma structure.

Summing up, morphogenesis of a homogeneous type of tuberculoma in non-aboriginal patients starts more often from the development of an extensive infiltrate following

lymphohematogenous tuberculosis. Interestingly, the specific alterations in the lungs developed amid unaltered lung tissue. Formation of tuberculomas in most patients from non-aboriginal population is not associated with the development of markedly expressed fibrosis of lung tissue. These distinct tuberculoma features were determined by predomination of the processes of healing and alveolar epithelium renewal over inflammatory alterations, which in the end favored a better repair of the structure of lung parenchyma.

Clinical examinations showed, that morphogenesis of a laminated type of pulmonary tuberculoma among non-aboriginal population started from lymphohematogenous spread of tuberculosis in 10 (58.8%) patients. Fresh dissemination foci developed amid unaffected lung tissue, and located mainly ( $70.0 \pm 3.5\%$ ;  $p < 0.01$ ) in the upper and mid lung lobes.

Notably, morphogenesis of laminated tuberculomas in non-aboriginal patients in most cases ( $60.0 \pm 2.5\%$ ;  $p < 0.01$ ) started from repeated episodes of acute aggravation of the specific pathological process around fresh conglomerate foci. Soon after the development of infiltrative-pneumonic inflammation around small conglomerate foci, they became gradually affected by caseous necrosis and then transformed to an encapsulated caseous-pneumonic focus. Later, as the perifocal exudation gradually resolved, each of the foci became encapsulated by capsules that were shared between neighboring foci. Tuberculoma then grew concentrically around this encapsulated caseous-pneumonic focus, as the result of interchanging waves of perifocal necrosis and encapsulation. Later a laminated structure of tuberculoma formed, as an outcome of periodical exacerbations of tuberculosis and appositional growth around the encapsulated caseous-pneumonic focus.

We noted that bronchopulmonary lymph nodes and perihilum tissue remained intact in all of the patients. Tuberculoma formation was not associated with development of fibrotic alterations of the lung tissue and pleura. However, in patients from non-aboriginal population the formation of a laminated type of tuberculoma from out of a tuberculous focus took longer time, compared to patients from aboriginal population, with the difference between them ranging from 1.5 months to 2 months.

In conclusion, the formulation of criteria that clinically and morphologically define the development conditions for caseous foci became the groundwork for a detailed study of the most frequently occurring morphogenesis patterns for different types of lung tuberculomas found in patients living in the Extreme North with its harsh environmental and social conditions. Definition of distinctive features of the morphogenesis and clinical course of different types of pulmonary tuberculomas will make it possible to give grounds for and to shape individualized chemotherapy regimes and approaches to surgical treatment of patients.

Table 1

**Effect of tuberculosis genesis on morphogenesis variants of pulmonary tuberculomas in patients from non-aboriginal population, in an Extreme-North region**

Sites of morphogenesis of tuberculomas	Number of foci	Way of tuberculosis genesis					
		Lymphogenous		Hematogenous		Lymphohematogenous	
	Absolute number	Absolute number	%	Absolute number	%	Absolute number	%
Focus	17	7	$41.2 \pm 1.3^*$	-	-	10	$58.8 \pm 1.9$
Infiltrate	158	10	$6.3 \pm 0.6$	29	$18.4 \pm 1.1$	119	$75.3 \pm 2.1^*$
Cavity	2	2	100.0	-	-	-	-
Total	177	19	$10.7 \pm 1.1$	29	$16.4 \pm 2.2$	129	$72.9 \pm 3.2$

\*- differences are valid ( $p < 0.05$ ) between morphogenesis variants

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**Neuropsychological study of children with attention deficit disorder  
in the process of beta-stimulating biofeedback.**

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UDC 159.9.072

This article analyzes the clinical and electroencephalographic effects of EEG beta training in treating children with attention deficit disorder.

Presents the results of neuropsychological examination of 68 children diagnosed with attention deficit / hyperactivity (ADHD) by the method of Luria's in the rehabilitation course of EEG beta training. Analysis of the results suggests that in the most children with ADHD, the primary cause of the characteristic symptom is a dysfunction of subcortical-stem structures of the brain, but there are children with clear symptoms of ADHD, but no signs of dysfunction of subcortical structures.

Key words: Attention Deficit Disorder, neurobiofeedback, neuropsychological tests.