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AORTOPULMONARY COLLATERALS A TOOL FOR DIAGNOSIS OF CHRONIC THROMBOEMBOLIC PULMONARY HYPERTENSION: CLINICAL AND EXPERIMENTAL DATA

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Introduction. After finding that aortopulmonary collaterals (APC) accompany regularly chronic thromboembolic pulmonary hypertension (CTEPH) (Endrys et al. Heart 78: 171-6, 1997) we tried to analyze their value in diagnosis of CTEPH especially in differentiation from idiopathic pulmonary hypertension (IPH). Experimentally we attempted to find out the size of embolus producing APC and timing of their angiographic manifestation.
Method. 31 patients with CTEPH and 34 patients with IPH were studied using different methods as time went on in proving and quantifying APC: dye dilution curves, aortography, bronchial angiography and computer tomography (CT).
Experimentally 44 dogs were embolized with microspheres of different sizes to double basal mean pulmonary arterial pressure. Development of APC and its timing was analysed angiographically.
Results. In the group of 8 patients with CTEPH we found in all high values of AC flow: 0.93 (0.4-1.8) l/min, while in 14 patients with IPH only traces were measured in 4 and in 12 APC flow was not measurable at all. Aortography or bronchial arteriography and later CT showed extensive APC in all patients with CTPH. In all APC bronchial arteries, in few additional intercostal, coronary and internal mammary arteries were involved. In some peripheral branches of the centrally occluded pulmonary arteries were visualized. On the other hand in IPH just hardly visible normal bronchial arteries were identified.
Experimentally emboli 0.4 mm of diameter or larger produced APC in all animals while microspheres 0.3 mm and smaller did not. The first increment of bronchial arteries was observed 3-5 days after embolization and final extent of APC was established after 6 weeks.
Conclusions. Extensive APC invariably develop in CTEPH. Presence of APC sharply differentiated patients with CTPH from patients with IPH. Regarding to the diffuse process of embolization in CTPH the simplest method how to prove APC is just a selective arteriography of the main bronchial artery located close to the tracheal bifurcation. It is easy to do using just few ml of contrast dye which is much safer than pulmonary arteriography. We feel that marked filling of peripheral branches of pulmonary artery through APC may be favorable sign for endarterectomy result.