

Decision changing in the operating room: The importance of the surgeon's certainty and a well prepared team

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We read with great interest the paper: “Salvage pneumonectomy for pulmonary arterio-venous malformation in a 12-year-old boy with brain abscess and hemiparesis: A fatal outcome.” In this report, the authors analyze the case of 12-year-old boy with large pulmonary arteriovenous fistula presenting with brain abscess and hemiparesis. It was decided to perform a thoracotomy for pneumonectomy, which was complicated by massive bleeding, due to severe pleuropulmonary adhesions and collateral blood flow through small arteriovenous malformations. The patient developed the systemic inflammatory response syndrome, with a deadly outcome few days later.

Although the surgical approach to large pulmonary arteriovenous is a valuable and, sometimes, the best technical option, the importance of emboli therapy should not be underestimate, even in cases of these large pulmonary arteriovenous malformations. The angiography during emboli therapy could reveal extended collateral flow, and the emboli therapy itself, even if not a complete therapeutic option could obstruct the flow through collateral vessels, diminishing the chances of intraoperative bleeding.^[1]

“Salvage” pneumonectomy is a well-described procedure in the literature and makes reference to a pneumonectomy performed on an urgent basis,^[2,3] aiming to save the patient's life. Although necessary to preserve life, pneumonectomy is a “disease in itself,”^[4] due to the morbidity related to the procedure, especially related the late development of cor pulmonale. The decision to perform this procedure during the surgery is a tough decision for both the surgeon and his team. The importance to have equipment available and the well-trained team should not be overemphasized.

The authors suggest that a previous embolization should have been done, with the purpose to diminish to collateral blood flow. Besides this goal, the treatment of the pulmonary arteriovenous malformation can be done, if not completely, at least partially, by means of embolization. There are different methods and materials available for this procedure.^[1,5-7] The use of ordinary coils, cutted hemostatic

sponge, Gianturco coils,^[7] vascular plugs^[5] have a very good success rate in diminishing the blood flow through malformation. Of course, we know that availability of all these methods is not equal throughout the world, and surgery is a well-described method for treating large pulmonary arteriovenous malformation.

Regarding technical aspects of a pneumonectomy in the case of severe pleuropulmonary adhesences, the preferred approach is through a posterolateral thoracotomy. The median sternotomy is a possible approach but has more complications regarding sternotomy. In the case of intense adhesences, an extrapleural technique can be executed; moreover, in these cases, the mediastinal pleura is usually not too adherent, so intrapericardial vessel ligation may be done without the need for a median sternotomy.^[8] Authors also wonder if internal mammary artery ligation could help stop bleeding. As intercostal arteries are direct branches from thoracic aorta, this ligation would have minimal if some, effect in diminishing the “massive bleeding” reported.

Finally, the authors report their difficulties in performing an extremely complex surgical procedure and discuss the therapeutic options that could be done. Every surgeon knows that is easy to look back and have a “better, or evidence-based” opinion about what should and what should not have been done in a particular case, but during the operating room struggling against a life threatening situation, the decision should be mad in minutes or seconds. In this regard, the importance of well-established protocols should not be an underestimate. The technical decision of the team was correct, as would have been any of the potential decisions discussed in the case report. The most important lesson learned is that the team must be prepared for every potential complication, and this includes well-trained surgeons, anesthesiologist, nurse team, and available equipment.

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