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The BLUE-protocol - The use of lung ultrasound for the diagnosis of hemodynamic pulmonary edema

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The BLUE-protocol (Bedside Lung Ultrasonography in Emergency) proposes a new way for diagnosing acute hemodynamic pulmonary edema (AHPE). It uses the potential of lung ultrasound. Using a simple equipment without Doppler and a single universal probe, the BLUE-protocol analyses the artifacts and dynamic arising from the pleural line. The profile which associates, at the anterior chest wall, lung sliding with lung rockets, is called the B-profile. Lung sliding is a twinkling visible at the pleural line indicating absence of pneumothorax and correct movement of the visceral pleura with respect to the motionless parietal pleura, indicating correct lung implication. Lung rockets are several (more than 2) B-lines visible between two ribs in a longitudinal scan. The B-line is a hydro-aeric artifact which combines seven criteria: A comet-tail, arising from the pleural line, moving in concert with lung sliding, long, well defined, erasing the A-lines (repetitions of the pleural line) and hyperechoic. The B-profile has for the diagnosis of AHPE, 97% sensitivity and 95% specificity. Lung ultrasound is therefore able to provide a piece of information which can be coupled with traditional echocardiography for an accurate diagnosis of hemodynamic pulmonary edema (a direct sign, whereas the detection of cardiac anomalies makes an indirect sign).

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Pulmonary valve implantation in the native outflow tract

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RVOT (Right Ventricular Outflow Tract) reconstruction is a significant component of many surgical repairs and residual RVOT dysfunction (stenosis and/or regurgitation), forms the primary indication for reoperation. Percutaneous PV implantation has been introduced to reduce the number of operations needed in the total lifetime of the patients. RVOT dysfunction and hundreds of PV have been implanted in condouits. Pulmonary valve implantation is now current practice in the treatment of failing conduits in the RVOT. However, the vast majority of tetralogy of fallot received trans-annular patch repair of the RVOT. Pulmonary regurgitation is frequent after conduit insertion and is an inevitable consequence of trans-annular patching and/or pulm. valvotomy will eventually compromise RV function. The patched outflow tract does not offer a rigid support for percutaneous pulmonary valve implantation, limiting the possibility of a catheter based treatment. From October 2010 through December 2014, a trans-catheter implantation of a prosthetic pulmonary valve has been performed succesfully on 45 patients, 27 of which had a transannula patch. A protocol of RVOT pre-stenting followed after 1-2 months by valve implantation has been utilized. One patient underwent surgery because of stent malposition, early in our experience, as well as 5 additional patients, in which the procedure was aborted because of coronary proximity or RVOT size. A succesful valve implantation was obtained in 21 patients. At a mean follow-up of 19 months, all patients improved from NYHA II-III to I, there was no significant PV insufficiency or stenosis, mean RV pressure was 25±9 mmHg, and there has been no stent migration or stent fractures.

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