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Traumatic total avulsion of the hepatic veins and suprahepatic vena cava. Lessons from a fatal case.

Blunt injuries to the hepato-caval confluence, although representing only a small proportion of all liver injuries, constitute the most difficult and deadly form of liver trauma having a mortality up to 80%. The mortality increases after total avulsion because the massive hemorrhage is complicated by the air embolism. We report on a 17-year-old boy who sustained a blunt trauma with a total avulsion of the hepatic veins and the suprahepatic inferior vena cava (IVC) . We treated the patient by abdominal approach followed by thoraco-abdominal approach to control the intrapericardic IVC. Under internal bypassing of the retrohepatic IVC and ECMO (Extracorporeal Membrane Oxigenation) the hepatic veins and suprahepatic IVC were reconstructed with a conduit made of bovine pericard. The patient suffered several cardiac arrests during the procedure but hemodynamic stability was achieved after completion of vein reconstruction. Nevertheless, an irreversible cardiac arrest happened when it was decided to remove ECMO because of limb ischemia from femoral artery dissection.

Discussion: Cases of true complete avulsion of the hepatocaval confluence are very rare or underreported because of the high death rate. The reported surgical strategies are focused on bleeding control and support of the circulatory function. The fatal course, in spite of vascular control, was related to severe air embolism that happened as the lesion was recognized. This raise several questions on how different possible strategies could change the outcome. After a case analysis, we suggest a different approach. When at the exploration of the surface of the liver in the massive nonpulsatile bleeding that follows the trauma shows that every connection between the liver and the diaphragm is missing, the only fast and maybe effective maneuver that should be attempted is to push the liver against the atrial orifice of the IVC until a sternotomy is performed and the intrapericardic IVC is clamped. This maneuver was never reported but could protect the patient from fatal air embolism. In spite of the the final result, every case should be seen as a chance for the re-examination of knowledge relating to this subject and perhaps, for a rethinking of current therapeutic approaches.