Incidence and risk factors of acute renal failure after ALPPS and its prognostic value on outcome

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Background:

In the current literature, the incidence of acute renal failure (ARF) after liver resection varies between 7-15%. However, these studies encompass different extents of conventional minor and major liver resections. It is well known and well investigated, that an impaired postoperative renal function increases morbidity and mortality after liver resection. The risk factors for the development of ARF can be divided into preoperative and intraoperative parameters. Preoperative laboratory values such as elevated ALT and an increased MELD score and comorbidities (cardiovascular disease, diabetes, chronic renal failure and advanced age) have an impact on the incidence of postoperative ARF. However, intraoperative risk factors, such as major hepatectomy and prolonged operative time, are the most important components to develop ARF. A previously published prediction score showed also that blood transfusions and the establishment of hepaticojejunostomies predict ARF after liver resection. Those findings suggest that postoperative inflammation, caused by the systemic inflammatory response syndrome, could be one cause of postoperative ARF. The ALPPS procedure is a novel combination of two established techniques in liver surgery with an extensive regenerative response. Therefore, it is unknown whether the incidence and risk factors to develop an ARF after standard liver resections also apply to ALPPS. With two operation steps, a prolonged operation time and higher use of blood transfusions a much higher incidence can be assumed. Additionally, the prognostic value of ARF on outcome in ALPPS patients could be even severe than after conventional liver resections.

Objectives:

This study will aim to provide the incidence and risk factors for the development of ARF after ALPPS. Furthermore, we will investigate if the prediction score and established risk factors also apply to the ALPPS procedure and calculate new risk factors for ARF in ALPPS patients. We will also analyze the association of ARF on morbidity and mortality.

Specific question #1: What is the incidence of ARF after ALPPS-Step-1 and Step-2?
Specific question #2: What are the risk factors for ARF after the ALPPS procedure?
Specific question #3: What is the impact of ARF after the ALPPS procedure on outcome?

Methods:

All patients in the ALPPS registry will be analyzed and screened for ARF after step-1 and step-2. Demographics, procedures, complications and survival will be analyzed for patients with ARF and without ARF. A multivariable logistic regression analysis will be performed in order to identify risk factors for the development of ARF. Statistical analysis will be performed with SPSS©.

Impact of the findings:

This is the first study to investigate the incidence of ARF after ALPPS. It will also provide risk factors for the development of ARF. Surgeons and anesthesiologists can use these factors for preoperative evaluation and postoperative management. This can also lead to improved patient selection for the procedure.