

# **ALPPS for non-CRLM and primary hepatobiliary malignancies: Is it becoming safer?**

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## **Background:**

Since the introduction of ALPPS by Schnitzbauer et al. in 2012 this novel method has been fiercely debated and over time diagnoses other than colorectal liver metastases (CRLM) as well as advanced age have become relative contraindications to the procedure. In the first analysis of the ALPPS registry by Schadde et al. the abovementioned factors were identified and following this the enthusiasm for ALPPS in the settings of primary hepatobiliary malignancies has reduced. In February 2015 the first International Expert Meeting on ALPPS concluded that CRLM remains the indication of choice for this procedure and caution should be exercised in the case of HCC, intrahepatic cholangiocarcinoma and perihilar cholangiocarcinoma (Oldhafer et al.). Similarly D'Haese et al. concluded in 2015 that the use of ALPPS in HCC patients was indicated only in highly selected cases younger than 60 years. Recent analysis of the overall Risk adjustment in ALPPS (Linecker et al. Submitted to Annals of Surgery, reference with permission from the first author) showed decreased use of ALPPS in settings other than CRLM although 23% of the procedures are still performed for indications with higher risk. These results do however only apply to centers with some experience with the procedure. Furthermore it is unknown if the adjustments made to the procedure and to the patient selection have made this type of surgery safer for patients with primary hepatobiliary malignancies and non-CRLM.

## **Objectives:**

The aim of this study is to evaluate the outcomes of ALPPS for primary hepatobiliary malignancies before the first analysis of the ALPPS registry as compared to after.

## **Methods:**

The international ALPPS registry will be analyzed for diagnosis other than CRLM. Early mortality (90 day or in-hospital) is the primary outcome variable. Morbidity, interstage and overall will be assessed as well as the length of the interstage period. The proposed ALPPS risk score (Linecker et al.) will be used to determine if patient selection has changed between the study periods. In addition results will be compared between centers with considerable experience with the ALPPS procedure and centers that have only registered one or few cases. The cutoff for this analysis will be decided upon based on the available spreading of case load.

## **Impact of the findings:**

As ALPPS is largely considered contraindicated for the abovementioned diagnosis in comparison to CRLM and this notion is based on early experience with this advanced surgical treatment it is important to explore the possibility that the safety has increased during development of the method.