



Author's Reply to “Liver Dysfunction with Both Roux-en-Y and One Anastomosis Gastric Bypass Is Almost Exclusively Seen with Longer Than Standard Limb Lengths” by Kamal K. Mahawar

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We would like to thank Dr. Mahawar for his interest in our article and letter to the editor [1]. The corresponding publication by Eilenberg and colleagues [2] reports a case series of consecutive in- and outpatients who presented with severe liver dysfunction after different types of gastric bypass from March 2014 through February 2017 performed at our center or elsewhere. For the first time, we reported the occurrence of severe liver function impairment after one anastomosis gastric bypass (OAGB) in five cases. Furthermore, the same clinical picture was observed in five patients after Roux-en-Y gastric bypass (RYGB) including two cases of distal RYGB. In all patients who received a lengthening of the common limb or reversal of the bypass, which was performed in eight of ten patients, led to an improvement or complete reversal of liver dysfunction within a short time period.

Four out of ten patients underwent bariatric surgery elsewhere, the remaining six patients underwent surgery at our center and are described meticulously in the manuscript. Two of these patients underwent revisional bariatric surgery (distal gastric bypass), four patients received an OAGB (one of these after proximal RYGB).

We agree with Dr. Mahawar that liver failure after proximal RYGB is a rare event. In most cases, proximal RYGB even leads to an improvement of liver disease [3]. Nevertheless, we observed liver dysfunction in three patients after proximal RYGB: The first patient, 7 years after the operation (BPL 60 cm, AL 200 cm, CC 200 cm), experienced a weight loss

of unknown origin and liver disease thereafter. The cause for this late-occurring weight loss remained unclear. However, liver dysfunction was resolved after gastric bypass reversal. The two further patients with liver dysfunction after proximal RYGB underwent surgery elsewhere and were referred to our center only after the occurrence of liver dysfunction. One patient died due to sepsis, therefore, limb lengths remain unknown. The other patient had a bilio-pancreatic limb (BPL) of 155 cm, alimentary limb (AL) of 210 cm, and common channel (CC) of 35 cm. This patient was converted by us to BPL of 15 cm, AL 210 cm, and CC 175 cm and experienced significant improvement thereafter.

In distal GB, the AL and CC together usually are 250 cm, yet there is a lack of a clear definition: Some authors describe a 100 cm CC with a 150 cm BPL [4], whereas others 50 cm CC and 200 cm AL [5]. Regarding OAGB, we started to perform this technique in 2010 with a standard BPL of 200 cm according to the publications of Rutledge, describing a malnutrition rate of 1.1% [6], but changed BPL lengths to 150 cm within the last 2 years due to observed excessive weight loss and occurrence of liver dysfunction in few patients. We thus agree with Dr. Mahawar that a 200 cm BPL may be associated with a higher probability of liver dysfunction. Extending the BPL as Lee et al. published [7] demands for counting the entire bowel length not to create a too short CC (at least 300 cm). All of the patients with OAGB, in whom the primary operation was performed at our center ($n = 3$), had a CC of at least 320 cm (500/320/395 cm).

Overall, in our series, thus, the CC dimensions (median length 357.5 cm) should have been more than sufficient for adequate absorption. Nevertheless, although BMI remained within a normal range, median %EWL was significantly higher than average. Consequently, an alleged adequate limb length seems not to guarantee appropriate absorption in every patient, and individual adaptation of the intestinal mucosa may play a role [8]. As long as the true underlying

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mechanisms of liver dysfunction are unclear, pre-operative evaluation of the liver and a thorough post-operative follow-up are necessary.

Compliance with Ethical Standards

Conflict of Interest The authors declare that they have no conflict of interest.

Ethical Approval Statement This article does not contain any studies with human participants or animals performed by any of the authors.

Informed Consent Statement Does not apply.

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