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## LETTER TO THE EDITOR

# Comment on hepatic artery reconstruction in living donor liver transplantation: strategy of the extension of graft or recipient artery

To the Editor

We read with great interest the article recently publication by Okochi and colleagues, 'Hepatic artery reconstruction in living donor liver transplantation: strategy of the extension of graft or recipient artery,' published in fourth issue of J Plast Surg Hand Surg [1]. In this study, authors stated that they aimed to identify the risk factors for the requirement of additional reconstructive procedures of direct anastomosis of hepatic artery (HA) in patients underwent living donor liver transplantation (LDLT). We would like to share our opinion and criticisms about this valuable work.

- Authors stated that the length of graft HA $< 8$ mm, and the gap between the recipient and graft HA $\geq 6$ mm were identified as the risk factors for the need of HA extension. We agree with the proposed idea of the authors; however, in order to evaluate discrete cut-off values, the authors should refer to a previously published study or even more accurate approach would be to perform the ROC analysis to calculate the cut-off values for HA extension. It is seen that the authors have not performed ROC analysis for length of HA and the gap between the graft and recipient HAs.

- The authors have stated that length of graft HA $< 8$ mm increases the risk of need for extension of the HA 84 times and furthermore, they showed that there was a positive correlation (0.618) between the length of graft HA and the HA extension (Authors' Table 4). We believe there is an important calculation error. As it is known very well, the principles of the mathematics are also applied to statistics. Odd's ratio (OR) is calculated from $2 \times 2$ crosstab and it cannot be calculated if any variable is 0; i.e. 'zero'. The reason for this is that division of any number to 0 is undefined; while 0 being divided by any number is zero. We have analyzed the variables expressed in authors' Table 4 and we have found that obtaining some of these calculations were impossible using statistical software program called SPSS 25 version (SPSS Inc., Chicago, IL). However, OR can be calculated using the 'Haldane-Anscombe correction' correction, which was first described in 1945 and is not generally accepted, but used by the MedCalc software program. Haldane suggested that adding 0.5 to each cell and the calculation of the OR from the resulting crosstab, which gives the modified maximum likelihood estimate (MMLE). This calculated this new OR value is defined as $OR_{MMLE}$ [2,3]. Based on this, we used the Haldane–Anscombe correction method and new calculated result was as follows: OR $= 90.7$ (95% CI $= 3.62–2273$) (Tables 1 and 2). When calculated in this way, it does not match the results obtained by the authors. The same evaluation is also valid for cause of LDLT variable. Furthermore, the authors have determined the Cramer V coefficient as $+0.618$ but this coefficient should have been a negative figure ($-0.618$). Since we know that as the length of the graft HA increases the need for HA extension is decreased and this correlation should be negative and strong.

- The authors have stated that above mentioned two variables were independent risk factors for need of HA extension. As it is known very well, in a study that involves more than one variable for a given, multivariate logistic regression analysis should be performed to determine the independent risk factors for any given categoric variable. Simply using a Fisher's exact test and calculation of OR is not enough to make such an extrapolation. Therefore, the authors should have used multivariate analysis in this study.

- Another subject of debate is the correlation between the length of graft HA and the gap between the graft and the recipient HAs. Theoretically, the gap between the graft and recipient HAs should be reduced as the length of graft HA is increased. However, we have made a correlation analysis on SPSS and calculated the Phi (Ø) coefficient (correlation coefficient $-0.189$ [$p=.119$]) which was negative but the correlation was very weak. The reason for this discrepancy is due to the fact that in 87.9% of the cases with graft HA length $\geq 8$ mm have a gap between the graft and recipient HA is $< 6$ mm. On the other hand, only 50% of the cases with graft HA $< 8$ mm has a gap between the graft and the recipient HAs $\geq 6$ mm.

- One of the major issues regarding the article is the idea behind the hypothesis of the study. What should be the end point of this study? What does the extension provide? What are the consequences of extension and different length and gap regarding HA thrombosis and short or long-term graft function? Therefore, answers regarding these questions should be given in the results and discussion section of the article.

- We would like the authors to clarify which HAs in the recipient do they usually use to perform the anastomosis? We perform 250–300 liver transplantation annually. More than 85% of the cases are LDLT. Majority of our cases are right lobe LDLT. We usually prefer to make the HA anastomosis to common HA in suitable cases. In left lobe grafts anastomosis to common HA is not technically challenging. If this artery cannot be used due to insufficiency of the length of the, we

**Table 1.** Standard OR calculation method.

| Groups | Length of graft HA (mm) | |
| --- | --- | --- |
| | <8 mm | ≥8 mm |
| Extension | 2 (a) | 3 (c) |
| No-extension | 0 (b) | 63 (d) |

OR$= (a/b)/(c/d) = (2/0)/(3/63) = (2*63)/(0*3) = 126/0 = \infty$ (undefined).

**Table 2.** Modified OR calculation method using Haldane–Anscombe correction.

| Groups | Length of graft HA (mm) | |
| --- | --- | --- |
| | <8 mm | ≥8 mm |
| Extension | 2 + 0.5 | 3 + 0.5 |
| No-extension | 0 + 0.5 | 63 + 0.5 |

OR$= (2.5/0.5)/(3.5/63.5) = (2.5*63.5)/(0.5*3.5) = (158.75)/(1.75) = 90.7$.

move more distally to proper HA or left HA (if the diameter and flow of this artery is sufficient). In extreme cases, the gastroduodenal artery may even be sacrificed to provide tension-free anastomosis on common HA and proper HA axis. Using autologous and homolog arterial grafts are a factor that increase the risk of HA thrombosis. In this study, the recipient site of the arterial reconstruction seems heterogenous and the decision to proceed for extension is subjective. In our opinion, HA thrombosis rates are indeterminate and therefore analyzing need for extension for HA under these circumstances do not meet the goal. In conclusion, the aim of this study is to evaluate the independent risk factors for need for extension of HA. For this reason, the statistical analysis should be evaluated accurately in order to obtain accurate results. Therefore, the authors should re-evaluate and make necessary correction in their analysis.

## Disclosure statement

The authors declare that they have no conflict of interest.

## ORCID

Sami Akbulut http://orcid.org/0000-0002-6864-7711

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Sami Akbulut , Tevfik Tolga Sahin and Sezai Yilmaz
*Deaprtment of Surgery and Liver Transplant Institute, Inonu University Faculty of Medicine, Malatya, Turkey*
akbulutsami@gmail.com