

Information S2

Correction of baseline imbalance in terms of number of liver metastases

We conducted this analysis to correct the baseline imbalance on number of liver metastases by respectively calculating the postoperative morbidity of patients with ≤ 3 or > 3 metastases after simultaneous or staged resection.

Take the patients with ≤ 3 metastases in simultaneous group for example. 6 studies reported data of number of liver metastases as " ≤ 3 vs. > 3 ". The data were sorted out in format of the proportion of patients with ≤ 3 metastases and the corresponding morbidity (Details in Table SS1). Considering that the postoperative morbidity was significantly related with the number of liver metastases, the proportion of patients with ≤ 3 metastases should have linear correlation with the corresponding morbidity (Details in Figure SS1A). Each study was considered as an observed value, and a linear regression model was constructed with 95% confidence interval (Linear equation in Table SS2). In this linear equation, independent variable was the proportion of patients with ≤ 3 metastases, and the dependent variable was postoperative morbidity. Each study was given the same weight in the model because all studies included in the meta-analysis were in high quality, with a sample size over 50. Point estimate for the independent variable = 1, we got the postoperative morbidity of patients with ≤ 3 metastases after simultaneous resection (17.2%, 95%CI = [0 - 37.3%]). And point estimate for the independent variable = 0, we got the morbidity of patients with > 3 metastases (49.4%, 95%CI = [9.4% - 89.5%]).

The same method was used to estimate the morbidity of patients with ≤ 3 metastases (13.8%, 95%CI = [0 - 28.6%]) or > 3 metastases (50.8%, 95%CI = [33.8% - 67.9%]) after staged resection (Linear equation in Table SS3).

We also conducted analyses of studies reported number of liver metastases as "Single vs. Multiple". The results showed no significant correlation in simultaneous group ($P = 0.250$) or staged group ($P = 0.193$), which meant that "Single vs. Multiple" was not a good cut-off value for number of liver metastases.

Table SS1 Data sorted out as the proportion of patients with ≤ 3 metastases, and the corresponding morbidity

| Studies | Simultaneous resection group | | | | Staged resection group | | | |
|--------------|--|-----------------------|---|-------------------------|--|-----------------------|---|-------------------------|
| | No. of patients with ≤ 3 liver metastases | Total No. of patients | Proportion of patients with ≤ 3 metastases | Postoperative morbidity | No. of patients with ≤ 3 liver metastases | Total No. of patients | Proportion of patients with ≤ 3 metastases | Postoperative morbidity |
| Thelen 2007 | 34 | 40 | 0.85 | 0.18 | 45 | 179 | 0.68 | 0.25 |
| Turrini 2007 | 42 | 57 | 0.74 | 0.21 | 19 | 62 | 0.44 | 0.31 |
| Wang 2008 | 32 | 37 | 0.86 | 0.24 | 9 | 46 | 0.76 | 0.20 |
| Weber 2003 | 29 | 35 | 0.82 | 0.23 | 20 | 62 | 0.63 | 0.32 |
| Xu 2009 | 68 | 96 | 0.71 | 0.34 | 22 | 79 | 0.67 | 0.28 |
| Yan 2007 | 37 | 73 | 0.51 | 0.31 | 13 | 30 | 0.23 | 0.43 |

Table SS2 Linear equation of proportion of patients with ≤ 3 metastases and the corresponding morbidity in simultaneous resection group

Coefficients^a

| Model | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. | 95.0% Confidence Interval for B | | Correlations | | | Collinearity Statistics | |
|---------------------|-----------------------------|------------|---------------------------|--------|------|---------------------------------|-------------|--------------|---------|-------|-------------------------|-------|
| | B | Std. Error | Beta | | | Lower Bound | Upper Bound | Zero-order | Partial | Part | Tolerance | VIF |
| 1 (Constant) | .494 | .134 | | 3.689 | .021 | .122 | .866 | | | | | |
| ≤ 3 metastases | -.323 | .176 | -.675 | -1.827 | .142 | -.813 | .167 | -.675 | -.675 | -.675 | 1.000 | 1.000 |

a. Dependent Variable: Morbidity

Table SS3 Linear equation of proportion of patients with ≤ 3 metastases and the corresponding morbidity in staged resection group

Coefficients^a

| Model | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. | 95.0% Confidence Interval for B | | Correlations | | | Collinearity Statistics | |
|---------------------|-----------------------------|------------|---------------------------|--------|------|---------------------------------|-------------|--------------|---------|-------|-------------------------|-------|
| | B | Std. Error | Beta | | | Lower Bound | Upper Bound | Zero-order | Partial | Part | Tolerance | VIF |
| 1 (Constant) | .509 | .049 | | 10.298 | .001 | .372 | .646 | | | | | |
| ≤ 3 metastases | -.371 | .083 | -.913 | -4.476 | .011 | -.601 | -.141 | -.913 | -.913 | -.913 | 1.000 | 1.000 |

a. Dependent Variable: Morbidity

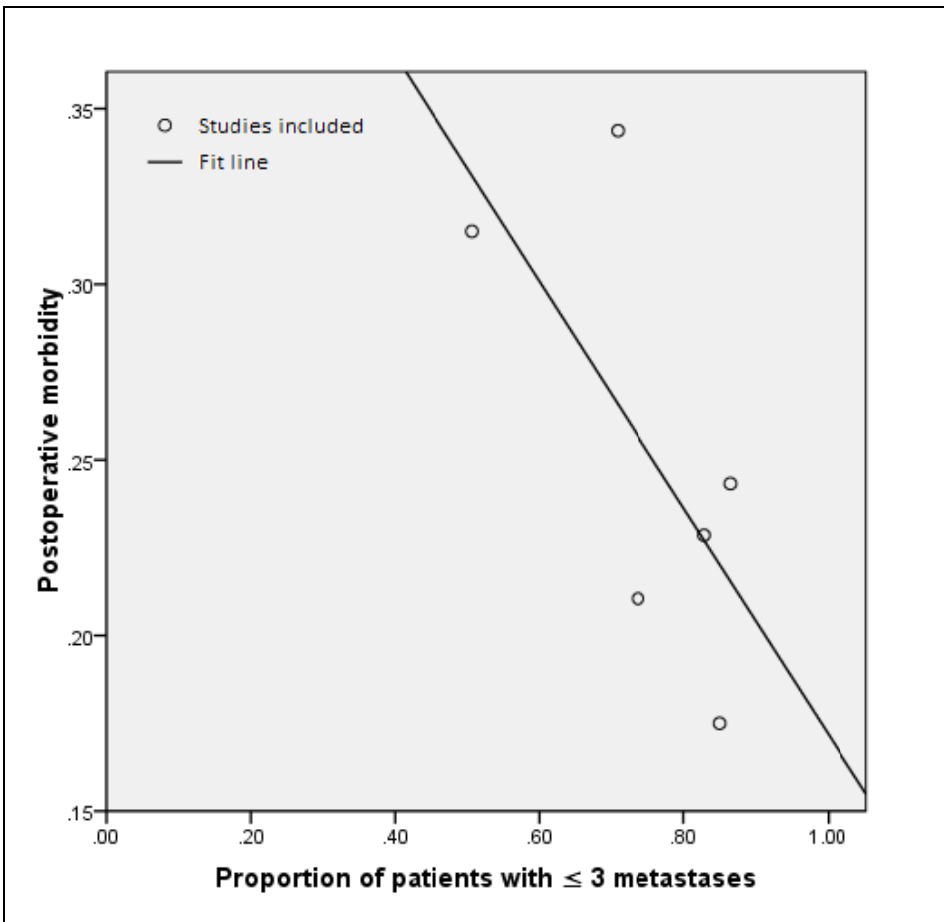


Figure SS1A Linear correlation between proportion of patients with ≤ 3 metastases and the postoperative morbidity in simultaneous resection group.

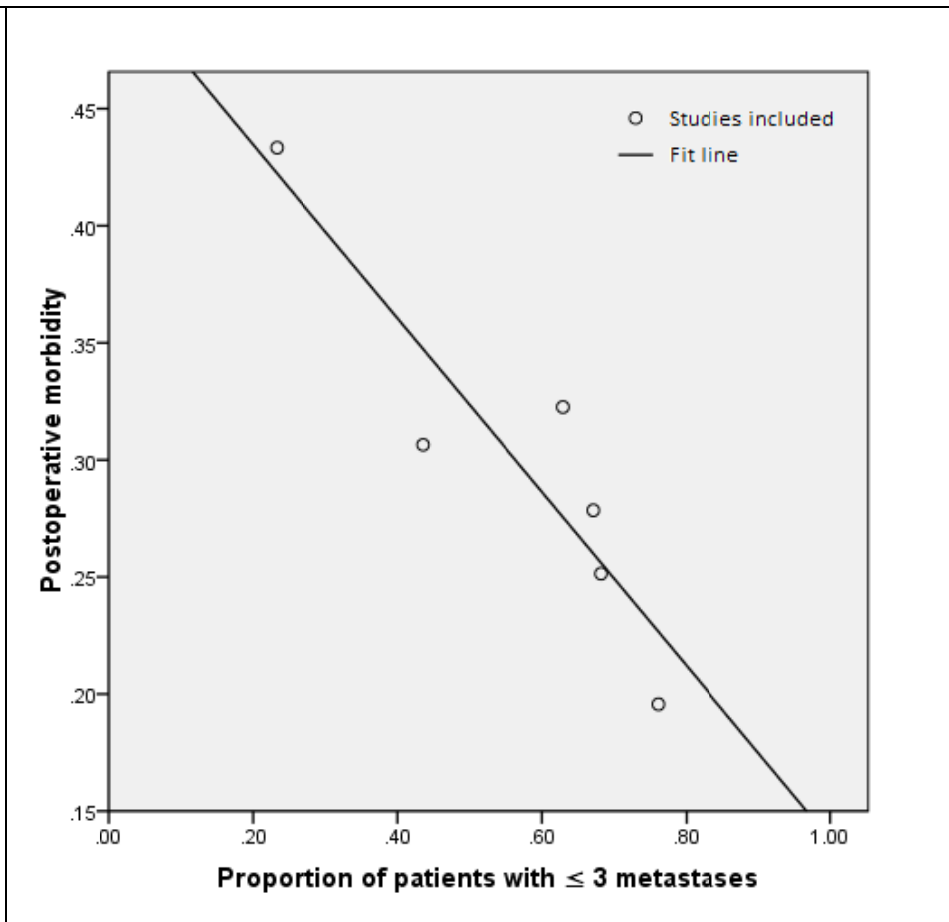


Figure SS1B Linear correlation between proportion of patients with ≤ 3 metastases and the postoperative morbidity in staged resection group.