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## Improving outcomes of pancreatic surgery

Groen, J.V.

### Citation

Groen, J. V. (2023, June 29). *Improving outcomes of pancreatic surgery*.

Retrieved from <https://hdl.handle.net/1887/3628261>

Version: Publisher's Version

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**Note:** To cite this publication please use the final published version (if applicable).

## CHAPTER 10

# **Pancreas-preserving surgical interventions during relaparotomy for pancreatic fistula after pancreatoduodenectomy**

J.V. Groen, F.J. Smits, I.Q. Molenaar, B.A. Bonsing, H.C. van Santvoort, J.S.D. Mieog, *for the Dutch Pancreatic Cancer Group*

## TO THE EDITOR

With great interest we read the study by Garnier et al.<sup>1</sup> regarding their four-step standardized technique during completion pancreatectomy for pancreatic fistula after pancreatoduodenectomy. They conclude that their standardized technique appears to be relatively safe, reproducible, and could be particularly useful for young surgeons. Although we support standardization of this technique, we don't agree with the additional statements that pancreas-preserving surgical interventions are associated with more reoperations and mortality and that simple surgical drainage should not be adopted.

Within the Dutch Pancreatic Cancer Group, we recently compared 36 patients undergoing completion pancreatectomy and 126 patients undergoing a pancreas-preserving intervention during the first relaparotomy for pancreatic fistula after pancreatoduodenectomy.<sup>2</sup> Mortality was higher after completion pancreatectomy (odds ratio after correction for confounders 2.55, 95% confidence interval 1.07-6.08). The proportion of additional reinterventions was not different between groups (64% vs 67%,  $P=0.76$ ). Additionally, we conducted a meta-analysis on mortality and found a similar association (745 patients, odds ratio 1.99, 95% confidence interval 1.03-3.84).

A subgroup analysis by different pancreas-preserving surgical interventions is shown in Table 1. The groups did not differ at baseline (before first relaparotomy for pancreatic fistula) regarding previous reinterventions, organ failure and APACHE II score. Mortality was 29% following simple surgical drainage vs 37% (range 30-44%) for the other subgroups ( $P=0.341$ ). Additional reinterventions were performed in 65% following simple surgical drainage vs 70% (range 60-83%) for the other subgroups ( $P=0.601$ ).

Simple surgical drainage was not associated with more reinterventions or mortality in our cohort compared to other pancreas-preserving surgical interventions. Therefore, we believe that, after failure of percutaneous drainage, simple surgical drainage is a viable option in the management of pancreatic fistula following pancreatoduodenectomy.

**Table 1.** Subgroup analysis following different surgical interventions during relaparotomy for pancreatic fistula after pancreatoduodenectomy

| Pancreas-preserving surgical interventions during relaparotomy for pancreatic fistula |                          |      |            |                 |       |                      |                                  |      |            |      |            |      |                                  |      |       |         |   |                      |
|---------------------------------------------------------------------------------------|--------------------------|------|------------|-----------------|-------|----------------------|----------------------------------|------|------------|------|------------|------|----------------------------------|------|-------|---------|---|----------------------|
|                                                                                       | Simple surgical drainage |      |            | Other subgroups |       |                      | Repair of pancreatic anastomosis |      |            | DAPR |            |      | DAPR with external wirsungostomy |      |       | Redo PJ |   |                      |
|                                                                                       | N                        | %    |            | N               | %     | P-value <sup>a</sup> | N                                | %    |            | N    | %          |      | N                                | %    |       | N       | % | P-value <sup>b</sup> |
| Total                                                                                 | 80                       | 63.5 | 46         | 36.5            | -     | -                    | 20                               | 15.8 | 12         | 9.5  | 9          | 7.1  | 5                                | 4.0  | -     |         |   | -                    |
| Baseline at time of relaparotomy                                                      |                          |      |            |                 |       |                      |                                  |      |            |      |            |      |                                  |      |       |         |   |                      |
| Previous reintervention                                                               |                          |      |            |                 |       |                      |                                  |      |            |      |            |      |                                  |      |       |         |   |                      |
| Organ failure 24h before*                                                             |                          |      |            |                 |       |                      |                                  |      |            |      |            |      |                                  |      |       |         |   |                      |
| No                                                                                    | 33                       | 41.3 | 24         | 52.2            | 0.236 |                      | 9                                | 45.0 | 7          | 58.3 | 7          | 77.8 | 1                                | 20.0 | 0.166 |         |   |                      |
| Single                                                                                | 43                       | 54.4 | 25         | 55.6            | 0.848 |                      | 14                               | 70.0 | 7          | 58.3 | 3          | 33.3 | 1                                | 25.0 | 0.235 |         |   |                      |
| Multiple                                                                              | 26                       | 32.9 | 13         | 28.9            |       |                      | 6                                | 30.0 | 2          | 16.7 | 3          | 33.3 | 2                                | 50.0 |       |         |   |                      |
| Highest APACHE II score 24h before*                                                   | 10                       | 12.7 | 7          | 15.6            |       |                      | 0                                | 0    | 3          | 25.0 | 3          | 33.3 | 1                                | 25.0 |       |         |   |                      |
| Median (IQR)                                                                          | 11 (8-14)                |      | 13 (9-16)  |                 | 0.116 |                      | 13 (7-17)                        |      | 12 (10-16) |      | 13 (12-15) |      | 11 (10-14)                       |      | 0.606 |         |   |                      |
| Postoperative day of first relaparotomy                                               | 9 (7-15)                 |      | 10 (6-14)  |                 | 0.871 |                      | 10 (7-14)                        |      | 13 (7-15)  |      | 9 (5-14)   |      | 4 (2-10)                         |      | 0.668 |         |   |                      |
| Main outcomes after relaparotomy                                                      |                          |      |            |                 |       |                      |                                  |      |            |      |            |      |                                  |      |       |         |   |                      |
| Mortality                                                                             |                          |      |            |                 |       |                      |                                  |      |            |      |            |      |                                  |      |       |         |   |                      |
| Organ failure 24h after*                                                              | 23                       | 28.8 | 17         | 37.0            | 0.341 |                      | 6                                | 30.0 | 5          | 41.7 | 4          | 44.4 | 2                                | 40.0 | 0.785 |         |   |                      |
| Single                                                                                | 22                       | 27.8 | 12         | 26.7            | 0.752 |                      | 7                                | 35.0 | 3          | 25.0 | 1          | 11.1 | 1                                | 20.0 | 0.894 |         |   |                      |
| Multiple                                                                              | 18                       | 22.8 | 8          | 17.8            |       |                      | 4                                | 20.0 | 2          | 16.7 | 1          | 11.1 | 1                                | 25.0 |       |         |   |                      |
| Highest APACHE II score 24h after*                                                    | 39                       | 49.4 | 25         | 55.6            |       |                      | 8                                | 40.0 | 7          | 58.3 | 7          | 77.8 | 2                                | 50.0 |       |         |   |                      |
| Median (IQR)                                                                          | 13 (11-17)               |      | 17 (13-21) |                 | 0.001 |                      | 17 (11-21)                       |      | 18 (16-23) |      | 16 (14-21) |      | 15 (15-17)                       |      | 0.013 |         |   |                      |
| Additional reintervention                                                             | 52                       | 65.0 | 32         | 69.6            | 0.601 |                      | 16                               | 80.0 | 10         | 83.3 | 7          | 77.8 | 3                                | 60.0 | 0.627 |         |   |                      |
| Secondary completion pancreatectomy                                                   | 3                        | 3.8  | 7          | 15.2            | 0.022 |                      | 4                                | 20.0 | 2          | 16.7 | 1          | 1.11 | 0                                |      | 0.103 |         |   |                      |

Abbreviations: DAPR: disconnection of pancreatic anastomosis with preservation of remnant; PJ: pancreaticojejunostomy; APACHE: Acute Physiology And Chronic Health Evaluation; IQR: interquartile range

\*Missing data: organ failure 24h before (N=2), highest APACHE II score 24h before (N=14), organ failure 24h after (N=2), highest APACHE II score 24h after (N=15)

<sup>a</sup> Comparison between simple surgical drainage and other subgroups

<sup>b</sup> Comparison between all pancreas-preserving interventions

## REFERENCES

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