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How the surgical community failed to reduce mortality after pancreaticoduodenectomy: ongoing plea for centralization

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There is growing evidence that centralization of high-risk surgery leads to a decrease in mortality. A plea for centralization of pancreaticoduodenectomy (PD) in high-volume centers has been taken place in the Netherlands, the only country with an independent nationwide registry. To analyze the effect of this plea, changes in mortality after PD as well as changes in referral pattern were evaluated in the Netherlands between 1994 and 2003. During nine years no change towards centralization was seen. Thus, the plea for centralization of PD in the Netherlands did not have the desired effect.
Pancreaticoduodenectomy (PD) is a high-risk procedure with better outcomes when performed in high-volume hospitals. Since the start of using data from the independent, nationwide registry on mortality after certain surgical procedures in 1994, there has been a continuous plea for centralization of PD in the Netherlands, a relative small country with easy access to tertiary referral center. At different time points, available national and international data on the volume-outcome relationship were published in national and international journals and presented at meetings of the Dutch Society of Surgical Oncology as well as at the Dutch Society of Gastroenterology. These presentations were followed by profound discussions on the consequences of centralization of PD in the Netherlands. Proponents were generally surgeons from high-volume referral centers with low mortality rates suggesting mortality differences up to 400%. Opponents were generally surgeons from low-volume community hospitals with varying results, also frequently suggesting a negative influence of moving patients far from home and family. The aim of this evaluation was to determine the effect of the ongoing plea for centralization among these specialists on the hospital mortality after PD and the referral pattern in the Netherlands.

Data from the independent, nationwide registry (Prismant, Utrecht, the Netherlands) on the results of PD including post-operative death were obtained from 1994 to 2003. The anonymously provided mortality data were collected from each Dutch hospital except for two cancer institutes that performed less than 1% of the procedures. The codes used by the registry were based on the International Classification of Diseases, 9th revision, Clinical Modification (ICD-9-CM); we evaluated only Code 5-526 (pylorus preserving pancreaticoduodenectomy) to exclude potential case-mix. The parameters analyzed at regular intervals were hospital mortality, hospital volume, and age. Morbidity factors were not assessed because they were not documented in detail for all patients in the registry. Hospitals were arbitrarily divided into four volume categories based on the number of PDs performed per year: fewer than 5, 5 to 9, 10 to 24, and 25 or more.

The first evaluation over 1994 and 1995 including 428 patients showed that the mortality was 16.1% in hospitals performing less than 5 PDs per year compared to 1.5% in hospitals performing 25 or more PDs per year. Mortality was higher in patients older than 70 years (16.2%) compared with patients younger than 55 years (6.2%) (p<0.05). Consensus was reached during several meetings that surgeons should as a first step at least monitor their own quality control and decide themselves whether it was justified to continue pancreatic surgery. The second evaluation over 1996 until 1998 showed similar results; 15.9% mortality in hospitals performing less than 5 PDS per year compared to 0.6% mortality in hospitals performing 25 or more PDS per year. No change was seen in referral pattern since the first national evaluation and proponents of centralization judged this outcome as unacceptable. The generally used explanation among the opponents of centralization was that the time to implement the self-monitoring strategy had been too short to detect a change in mortality and / or referral pattern. Another argument was
that surgeons from low-volume hospitals started only shortly before the second evaluation the implementation of the so-called networks: surgeons from a few low-volume hospitals performed PDs together in an attempt to improve experience. Mortality is partly caused by limited surgical experience but also by inadequate management of post-operative complications such as bleeding and leakage notorious 3 to 7 days after PD. The 1999-2000 findings again showed no improvement in nationwide mortality rates after PD, and an extensive discussion followed at the Dutch Society of Surgery 100th Anniversary Meeting in 2002. However, during the following last two years (2001 and 2002) in which again several evaluations were presented at national meetings, no major changes in mortality or referral pattern were seen.

Figure 1 shows the hospital mortality in the four volume categories at the different time intervals between 1994 and 2003. The mortality rate after PD in hospitals performing less than 5 PDs per year compared to the hospitals performing more than 24 PDs per year was 16.1% versus 1.5% in 1994 and did not change significantly to 14.8% versus 2.5% in 2002. Figure 2 shows the referral pattern to hospitals performing less than ten PDs per year over the 9-year period. During 2001 and 2002, still 285/501 (56.9%) patients underwent surgery in hospitals with a volume of less than ten PDs per year, compared to 280/428 (65.4%) patients between 1994 and 1996. The volume categories showed identical results.

In summary, this evaluation showed that the 9-year lasting plea for centralization among the surgical community did not result in a reduction of the mortality rate after PD or change in the referral pattern in the Netherlands. We can conclude that the system of frequent evaluation of the National Registry and nationwide discussions failed to convince surgeons to stop performing PD in low-volume centers. Recently other methods such as interference by the government or
insurance companies have been introduced in some European countries and the USA to change this pattern and to achieve a strong patient driven action towards centralization.\textsuperscript{1,2} The Dutch Government and National Health Council have made a first step recently to register volume and outcome of high-risk procedures, and this might be necessary to force the Dutch surgical community to centralize.

References