Annals of Gastroenterology (2016) **29,** 101-102

Pancreatic surgery in the elderly: overcoming the prejudices

Christos Agalianos[a], Christos Dervenis[b]

Athens Naval and Veterans Hospital; Konstantopouleion General Hospital of Athens, Greece

The percentage of the world's population aged over 65 years is rising, with an estimate that average life expectancy will increase from 75.9 years in 1995 to 79.1 years in 2025 [1]. Based on this growing elderly population, a consequent rise in age-related diseases like cancer should be expected [2]. Taking these facts into account, many studies have tried to prove the safety of surgical resections in cases of liver, gastric or colorectal cancer patients [3-5]. However, compared with resection for pancreatic malignancies, these operations are usually simpler, with fewer postoperative complications and a higher probability of achieving a long time survival. As a result, dealing with pancreatic cancer in an elderly population can be challenging for both the surgeon and the organised healthcare system, in order to select the appropriate patient for a specific treatment. Despite the improved postoperative outcomes, due to enhanced recovery protocols implementation [6], standardization of complications' definition [7] and creation of centers of excellence [8], pancreatic resections still carry a 40-58% of morbidity and a 2-4% of mortality in high-volume centers [9,10]. Moreover, decreased physiological reserves, along with co-morbidities and the effect of age on the operation and the long-term outcomes are increasing the complexity of the appropriate management of these patients. Thus, the absolute number of patients operated for pancreatic malignancies is declining from 40% in patients aged 66-70 to 21% in patients aged 80-84 [11]. However, this decrease is not fully justified from the results of large studies showing that pancreatic resection can be safely performed in selected groups of elderly patients.

More specifically, in two recent meta-analyses, apart from specific postoperative complications like cardiac and pneumonia, increased in the elderly study groups, comparison of overall complications has led to doubtful results in favor of the younger patients [1,12]. A thorough analysis by the authors revealed that overall complications may be increased in patients over 75, but when excluding patients over 80, this difference was not statistically significant [1]. Moreover, patients with similar preoperative comorbidities presented with comparable postoperative morbidity, despite the age difference [12]. Surprisingly, no significant difference could be identified in terms of pancreatic resection-related complications, like pancreatic fistula or delayed gastric emptying between different age groups, in neither the aforementioned meta analyses or in more recent studies from high-volume centers [1,12-14]. Finally, discrepancy exists when comparing the postoperative hospital stay, highlighting the problems in analyzing the optimal management of elderly patients [1,12].

Regarding postoperative mortality, either single institution studies or population-based studies agree that it is increased with advanced age at the time of operation [11]. However, severe biases due to pre-treatment selection, mixed results from high- and low-volume centers and different definitions of mortality -in hospital, 30 or 90 days- prevent authors from producing solid evidence [1,12]. Nevertheless, even when analyzing these underpowered studies a 6.2% mortality in patients over 80, referred to as the highest percentage in Casadei's meta-analysis, cannot be considered as disappointing [12]. Apart from short-term outcomes, results regarding long-term survival are also crucial when having to decide the optimal treatment in elderly patients suffering from pancreatic cancer. Overall survival is comparable between young and older population, proving that the beneficial effect on survival of pancreatic resection is not diminished with age [11,15,16]. Last, but not least, the pivotal study from Vickers *et al* regarding the economic considerations of performing pancreatectomy in the elderly concluded that total costs were comparable between old and young populations [17].

Similar to the previous results reported in the literature, a study from Sweden published in this issue of *Annals of Gastroenterology* found no difference in terms of postoperative morbidity, mortality, re-operation rates, and hospital stay between different age groups undergoing pancreatectomy [18]. This well-organized study provides more important data to overcome the prejudice regarding the safety of pancreatic resections in patients over 75 years old. Taking into account that to date pancreatectomy presents the only hope to achieve long-term survival, denying resection to the elderly seems at least unethical, especially when the available literature cannot support the existing aphorism of not performing pancreatic resections in this specific population. Carefully chosen elderly patients, based on performance status and presence of co-morbidities, organized units of pancreatic surgery, including satisfactory rehabilitation and post-discharge services, can provide excellent short- and long-term results, comparable to those of younger patients. Carefully designed prospective or large population-based studies, with strict definitions and outcomes are needed to limit biases and to provide solid evidence regarding the optimal management of older patients with pancreatic cancer.

Departments of Surgery [a]Athens Naval and Veterans Hospital Christos Agalianos); [b]Konstantopouleion General Hospital of Athens (Christos Dervenis), Greece

Conflict of Interest: None

Correspondence to: Christos Agalianos, Department of General Surgery, Athens Naval & Veterans Hospital, 70 Dinokratous Str, 11521 Athens, Greece, e-mail: xagali@gmail.com

Received 24 December 2015; accepted 28 December 2015

DOI: http://dx.doi.org/10.20524/aog.2016.0002

In conclusion, we believe that the answer to the question "Should pancreatic resection be performed in an elderly population?" could be that "Pancreatic resection in older patients can be safely performed in selected group of patients". Decision on performing a pancreatic resection should not be based on the chronological age, but on the best chance of a curative resection in an otherwise healthy geriatric patient.

References

1. Sukharamwala P, Thoens J, Szuchmacher M, et al. Advanced age is a risk factor for post-operative complications and mortality after a pancreaticoduodenectomy: a meta-analysis and systematic review. *HPB (Oxford)* 2012;**14**:649-657.
2. Jemal A, Bray F, Center MM, et al. Global cancer statistics. *CA Cancer J Clin* 2011;**61**:69-90.
3. Xie M, Zhu J, He X, et al. Liver Metastasis from colorectal cancer in the elderly: is surgery justified? *Dig Dis Sci* 2015;**60**:3525-3535.
4. Hsu JT, Liu MS, Wang F, et al. Standard radical gastrectomy in octogenarians and nonagenarians with gastric cancer: are short-term surgical results and long-term survival substantial? *J Gastrointest Surg* 2012;**16**:728-737.
5. Kordatou Z, Kountourakis P, Papamichael D. Treatment of older patients with colorectal cancer: a perspective review. *Ther Adv Med Oncol* 2014;**6**:128-140.
6. Kagedan DJ, Ahmed M, Devitt KS, Wei AC. Enhanced recovery after pancreatic surgery: a systematic review of the evidence. *HPB (Oxford)* 2015;**17**:11-16.
7. Bassi C, Dervenis C, Butturini G, et al. Postoperative pancreatic fistula: an international study group (ISGPF) definition. *Surgery* 2005;**138**:8-13.
8. Gouma DJ, van Geenen RC, van Gulik TM, et al. Rates of complications and death after pancreaticoduodenectomy: risk factors and the impact of hospital volume. *Ann Surg* 2000;**232**:786-795.
9. Hartwig W, Werner J, Jager D, et al. Improvement of surgical results for pancreatic cancer. *Lancet Oncol* 2013;**14**:e476-e485.
10. Pugalenthi A, Protic M, Gonen M, et al. Postoperative complications and overall survival after pancreaticoduodenectomy for pancreatic ductal adenocarcinoma. *J Surg Oncol* 2016;**113**:188-193.
11. Riall TS. What is the effect of age on pancreatic resection? *Adv Surg* 2009;**43**:233-249.
12. Casadei R, Ricci C, Lazzarini E, et al. Pancreatic resection in patients 80 years or older: a meta-analysis and systematic review. *Pancreas* 2014;**43**:1208-1218.
13. Adham M, Bredt LC, Robert M, et al. Pancreatic resection in elderly patients: should it be denied? *Langenbecks Arch Surg* 2014;**399**:449-459.
14. Beltrame V, Gruppo M, Pastorelli D, et al. Outcome of pancreaticoduodenectomy in octogenarians: Single institution's experience and review of the literature. *J Visc Surg* 2015;**152**:279-284.
15. Ballarin R, Spaggiari M, Di Benedetto F, et al. Do not deny pancreatic resection to elderly patients. *J Gastrointest Surg* 2009;**13**:341-348.
16. Petrowsky H, Clavien PA. Should we deny surgery for malignant hepato-pancreatico-biliary tumors to elderly patients? *World J Surg* 2005;**29**:1093-1100.
17. Vickers SM, Kerby JD, Smoot TM, et al. Economics of pancreatoduodenectomy in the elderly. *Surgery* 1996;**120**:620-625; discussion 625-626.
18. Ansari D AL, Frediksson J, Andersson B, Andersson R. Safety of pancreatic resection in the elderly: a retrospective analysis of 556 patients. *Ann Gastroenterol* 2016;**29**:221-225.