

胰头癌R0切除时手术切缘的界定及影响因素

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R0 resection of pancreatic head carcinoma: Definition of surgical margins and influencing factors

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Abstract

Early diagnosis of pancreatic head carcinoma is difficult. Once diagnosed, it often has been in the advanced stage, the prognosis is poor, and five-year survival does not exceed 6%. R0 resection is the only way to obtain long-term survival in patients with pancreatic head cancer. Numerous clinical studies have shown that lack of retroperitoneal tissue dissection is the important reason for being unable to achieve R0 resection in pancreatic cancer patients. The proposed mesopancreas and total mesopancreas excision (TMpE) concept provides a better definition of retroperitoneal dissection, thereby increasing the rate of R0 resection effectively.

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Key Words: R0 resection; Mesopancreas; Total mesopancreas excision; Pancreatic head carcinoma; Pancreaticoduodenectomy

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摘要

胰头癌早期诊断困难, 确诊时常已发展至晚期, 预后差, 5年生存率不超过6%。R0切除是

背景资料

胰头癌早期确诊困难、手术切除率低, 预后差, 是否接受根治性的R0切除, 是决定胰头癌患者远期生存的关键性因素。由于腹膜后组织清扫不足是胰头癌患者无法达到R0切除的重要原因, 如何更好地界定手术切缘, 提高R0切除率进而提高胰头癌患者的长期生存率迫在眉睫。

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■ 研究前沿

胰腺后腹膜切缘作为一个独立危险因素对胰头癌患者的预后产生了显著的影响, 在R0切除中显得至关重要。胰腺系膜和胰腺全系膜切除概念的提出重新界定了胰头癌R0切除的关键区域和整块切除的理念, 以期提高胰头癌患者的生存率。

胰头癌患者可能获得长期生存机会的唯一方法。大量临床研究表明, 腹膜后组织清扫范围不够是胰头癌患者无法达到R0切除的重要原因。胰腺系膜和胰腺全系膜切除(total mesopancreas excision, TMpE)概念的提出更好地定义了手术中腹膜后的清扫范围, 从而更有效地提高了R0切除率。

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关键词: R0切除; 胰腺系膜; 胰腺全系膜切除; 胰头癌; 胰十二指肠切除术

核心提示: 本文较为详实地描述了胰头癌达到R0切除时切缘的界定及相关影响因素, 以期提高胰头癌患者的长期生存率。

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0 引言

胰头癌早期确诊困难、手术切除率低, 预后差^[1]。患者是否接受了根治性的R0切除, 即达到无淋巴结转移的站组、无后腹膜浸润和显微镜下的无瘤性切除是决定胰头癌患者远期生存效果的关键性因素^[2]。然而, 胰头癌根治性切除标本的临床病理学研究显示, 至少有70%-80%的胰头癌患者并未获得严格意义上的R0切除^[3], 尤其是后腹膜切缘的阳性使得这部分患者的生存期明显缩短^[4]。近年来, 随着胰腺全系膜切除(total mesopancreas excision, TMpE)这一概念的提出, 人们对胰头癌R0切除又形成了全新的理解和认识, 也给胰头癌患者术后获得长期生存带来了新的希望^[5,6]。本文结合国内外相关文献, 对胰头癌手术达到R0切除时切缘的界定及影响因素进行相关阐述。

1 TMpE的概念

1.1 胰腺系膜 胰头癌是临床常见的胰腺恶性肿瘤, 早期确诊困难, 大多数患者临床就诊时已发展为中晚期^[7]。胰十二指肠切除术(pancreaticoduodenectomy, PD)是治疗胰头癌的经典术式^[8], 其切除范围通常包括胰头(含钩突)、肠系膜血管前方的胰腺组织、胰腺切缘距病灶2-3 cm、远端胃的1/3-1/2、十二指

肠、近段15 cm的空肠、胆囊和胆总管下段及区域淋巴结切除, 切除后将胰、胆总管和胃分别与空肠重新吻合^[9,10]。PD术后的组织标本一般可分为6个切缘, 即胆管、胃、胰腺断端、空肠、胰周淋巴结及胰周神经丛和后腹膜。前4个切缘做到R0切除并不困难, 但对于胰周淋巴结以及胰周神经丛而言, 由于胰腺癌呈浸润性生长, 且癌细胞具有嗜神经性, 因此可较早发生淋巴结转移。由于胰腺癌细胞可直接侵入神经束膜间隙并沿着神经束扩散, 所以对于进展期胰腺癌而言, 应重点清扫下腔静脉与腹主动脉之间及前方、肠系膜上动脉旁和肝总动脉旁的软组织、淋巴结和神经组织, 从而做到肠系膜上静脉、门静脉、肝总动脉和肠系膜上动脉的骨骼化。对于神经丛的切除则应包括右侧腹腔神经节、肝总动脉旁神经丛、腹腔干旁神经丛和肠系膜上动脉右半侧神经丛(第1、2部)^[11]。胰腺后腹膜切缘作为一个独立危险因素对胰腺癌患者的预后产生了显著的影响^[12,13], 在R0切除中显得至关重要。术前的CT分型和PD术中能否完整切除钩突是后腹膜切缘能否达到R0切除的关键因素^[14]。鉴于此区域难以准确界定, 为更精准地描述, Gockel等^[15]于2007年首次提出了胰腺系膜(mesopancreas)的组织病理学概念, 即胰腺背侧和肠系膜血管之间的神经淋巴组织层。Gaedcke等^[16]将这一概念更精确化定义为: 胰头后方及肠系膜上动脉右侧方的脂肪淋巴组织, 还包括胰腺实质与肠系膜上动脉间的脂肪、血管、淋巴管、神经组织以及引流胰头和钩突部的淋巴结。虽然胰腺系膜的概念尚存在争议^[17-19], 但胰头后方、肠系膜上静脉-门静脉后方、肠系膜上动脉、腹腔干及腹主动脉周围的结缔组织等区域始终是胰头癌发生侵袭转移的最常见的部位^[20,21], 也是R1切缘癌残留最常见的部位^[22]。从这个意义上讲, 胰腺系膜概念的提出重新界定并强调了胰头癌R0切除的关键区域和整块切除的理念, 并为其更好、更合理的实施打下了坚实的理论基础^[23]。

1.2 TMpE理念及其临床实践 TMpE的概念是在全直肠系膜切除(total mesorectal excision, TME)^[24]和全结肠系膜切除(complete mesocolic excision, CME)^[25]理念的推动下产生的, 其原则就是要强调胰头癌R0切除和整块切除的

理念^[26]。虽然TMpE的理论及切除规范至今仍然存在争议^[27,28], 但2012年Adham等^[29]证实, 应用TMpE理念可使胰头癌的R0切除率提高至80.7%。他们提出以胰腺系膜三角来界定胰腺系膜切除的范围, 即三角形的底边是肠系膜上静脉和门静脉的后方, 顶点是腹腔干和肠系膜上动脉起点间腹主动脉的前方, 包括肠系膜上动脉和腹腔干右半侧的神经丛, 且整体呈一倒三角形。他们以此作为TMpE的标准来指导手术操作, 并以肠系膜上动脉和腹腔干为起点, 应用沿肠系膜上动脉右侧包括连同胰头部全胰腺系膜切除的后入路技术实施了52例胰头癌PD手术, 结果42例达到了真正意义上的R0切除, R0切除率高达80.7%。国内学者亦在TMpE领域内做出了许多积极的探索。吴文广等^[30]以胰头及胰腺钩突部为界将胰腺系膜分为前、后部分: 胰腺系膜前部切除以胃癌网膜囊切除理念为指导, 切除范围包括结肠中静脉右侧的横结肠系膜前叶、胃网膜右动脉侧的大网膜、部分小网膜及门静脉、肝固有动脉、肝总动脉周围的淋巴脂肪组织, 还包括胃窦、十二指肠和胆总管等周围器官; 胰腺系膜后部切除范围以左肾静脉上缘水平为下界, 沿腹主动脉前方向上清扫至腹腔干起始处上方2 cm处, 而该水平则为胰腺系膜后部的上界, 同时清扫腹腔干右侧半的结缔组织。他们报道了75例胰头癌患者行TMpE后, 53例标本切缘经病理检查达到R0切除, 切除率为70.7%。洪德飞等^[31]应用前、后联合入路以胰头区域动脉优先离断的TMpE技术, 11例胰头癌患者行TMpE后R0切除率为100%。

2 胰头癌R0切除的影响因素

2.1 胰头癌R0切除与术前可切除性评估、胰头癌分期的关系

基于术前影像学检查结果对胰腺癌进行的分期在其术前可切除性评估中发挥了重要作用^[32]。T1、T2和T3期肿瘤是有可能切除的, 而T4期肿瘤(累及肠系膜上动脉或腹腔干)则是不可切除的。与以往研究不同的是, 累及肠系膜上静脉、门静脉或脾静脉的肿瘤被归为T3期, 因此这些静脉只要通畅即可进行切除和重建。胰腺癌术前可切除性评估的目的在于更加准确地判断肿瘤与胰腺周围血管、组织的解剖关系, 从而可以更合理地选择合适患者来进行根治性手术, 进而增加手术的R0切

除率^[33]。

2.2 胰头癌R0切除与病理检查技术、病理类型的关系

目前, 尚缺乏标准化的方式对PD术后的组织标本进行解剖及应用标准化的病理技术来定义真正意义上显微镜下的切缘阴性^[34]。对于组织切片而言, 病理医师的专业知识和经验也可对其产生较大影响, 如切片的切割可以是轴向、双边或多边等。此外, 病理医师经常难以准确区分确切的标本切缘等也是影响胰头癌R0切除的重要因素^[35]。因此, 外科医师在标本取材时最好能够采用一种精确易懂和有据可依的方法来界定一些重要的切缘, 同时应注意取材技巧, 标本取下时应注意其方向并以墨汁等染料对各个切缘加以标记。胰腺癌中约95%为导管细胞腺癌^[36,37], 而胰腺鳞癌则十分罕见, 约11.1%的肿瘤直径可超过6 cm, 且组织学检查亦发现胰腺鳞癌更易侵袭静脉, 故其总体生存率和R0切除率均明显低于前者^[38]。

2.3 胰头癌R0切除与新辅助治疗的关系

美国癌症联合会(American Joint Committee on Cancer, AJCC)胰腺癌指南将胰腺癌分为0-IV期, 0期为原位癌, I、II期为可切除胰腺癌, 而III、IV期则为不可切除胰腺癌^[39], 但在临床实践中常常会遇到介于两者之间的胰腺癌。随着相关研究的不断进展, 国内外学者提出了交界性可切除胰腺癌(borderline resectable pancreatic cancer, BRPC)的概念^[40,41]。BRPC患者手术切除标本切缘阳性率较高, 故术前必须对局部进展期且可能切除的胰腺癌患者的局部和全身情况进行综合评估, 然后选取合适的患者行新辅助治疗后再评估其最终的可切除性, 进而决定患者下一步是否能够接受手术治疗^[42,43]。此外, 新辅助治疗还可降低可切除肿瘤床的氧化作用, 使有些术前经新辅助治疗后的患者虽肿瘤体积无明显缩小, 但瘤体和血管间的间隙已较治疗前更加清晰, 从而比直接进行外科手术更加有效, 最终达到了提高患者R0切除率的目的^[44,45]。

2.4 胰头癌R0切除与手术路径及技巧的关系

随着人们对局部解剖认识的逐渐加深^[46,47], 术中组织分离手段、手术入路的改进及一系列外科新技术的不断应运而生(如经肠系膜上血管根部的左后入路、经钩突优先入路、悬吊法动脉优先入路等)可更加有效地提高手术的安全性及肿瘤的R0切除率^[48-50]。

■ 创新盘点

根治性R0切除是目前治疗胰头癌的最主要手段。随着胰腺系膜和胰腺全系膜切除概念的提出, 以及胰头癌R0切除和整块切除理念逐渐深入人心, 合理的术式选择, 可使患者最大程度的受益。

■应用要点

通过对胰头癌达到R0切除时切缘的界定及相关影响因素分析, 选取合适的手术方式, 提高对该病的诊治经验, 进而改善患者预后。

3 结论

胰头癌是一种严重威胁人类健康的疾病, 根治性的R0切除是唯一有效的治疗方式。然而在临床实践中, 多数R0切除实为R1切除, 因此为合理界定达到R0切除时的切缘界限, 胰腺系膜及TMpE理念应运而生。虽然此理念仍存在一定争议, 且仍需大样本或前瞻性多中心临床随机对照研究加以证实, 但胰腺系膜区域即为R1癌残留最常见部位, TMpE更是强调了包括神经、毛细血管及淋巴结在内的所有软组织的廓清, 可使后腹膜切缘范围得到更好的统一和规范, 从而进一步推动了胰十二指肠R0切除的标准化和规范化。

4 参考文献

- Krška Z, Šváb J, Hoskovec D, Ulrych J. Pancreatic cancer diagnostics and treatment - current state. *Prague Med Rep* 2015; 116: 253-267 [PMID: 26654799 DOI: 10.14712/23362936.2015.65]
- Jemal A, Siegel R, Ward E, Hao Y, Xu J, Murray T, Thun MJ. Cancer statistics, 2008. *CA Cancer J Clin* 2008; 58: 71-96 [PMID: 18287387 DOI: 10.3322/CA.2007.0010]
- Rau BM, Moritz K, Schuschab S, Alsfasser G, Prall F, Klar E. R1 resection in pancreatic cancer has significant impact on long-term outcome in standardized pathology modified for routine use. *Surgery* 2012; 152: S103-S111 [PMID: 22766366 DOI: 10.1016/j.surg.2012.05.015]
- Wolfgang CL, Herman JM, Laheru DA, Klein AP, Erdek MA, Fishman EK, Hruban RH. Recent progress in pancreatic cancer. *CA Cancer J Clin* 2013; 63: 318-348 [PMID: 23856911 DOI: 10.3322/caac.21190]
- Yang Y. [Total mesopancreas excision in pancreatic tumors]. *Zhonghua Waike Zazhi* 2014; 52: 644-646 [PMID: 25410775]
- Wang C. [Total mesopancreas excision in pancreatic cancer-clinical practice and controversy]. *Zhonghua Yixue Zazhi* 2014; 94: 1365-1367 [PMID: 25142981]
- Cao Z, Xu J, Shao Q, Zhang T, Zhao Y. Surgical treatment of pancreatic head cancer: concept revolutions and arguments. *Chin J Cancer Res* 2015; 27: 392-396 [PMID: 26361408 DOI: 10.3978/j.issn.1000-9604.2015.04.13]
- Popescu I, Dumitrașcu T. [Pancreatoduodenectomy - past, present and future]. *Chirurgia (Bucur)* 2011; 106: 287-296 [PMID: 21853734]
- Peparini N. Mesopancreas: A boundless structure, namely the rationale for dissection of the paraaortic area in pancreaticoduodenectomy for pancreatic head carcinoma. *World J Gastroenterol* 2015; 21: 2865-2870 [PMID: 25780282 DOI: 10.3748/wjg.v21.i10.2865]
- Georgescu S, Ursulescu C, Grigorean VT, Lupascu C. Hind right approach pancreaticoduodenectomy: from skill to indications. *Gastroenterol Res*

- Pract* 2014; 2014: 210835 [PMID: 25221601 DOI: 10.1155/2014/210835]
- Bender O, Bozkurt S, Buyukpinarbasili N, Marya FU, Battal M, Karatepe O. Clinical significance of intraoperative frozen section analysis of pancreatic cancer surgical margin at the time of pancreaticoduodenectomy. *Chirurgia (Bucur)* 2015; 110: 446-450 [PMID: 26531788]
 - Dumitrașcu T, Popescu I. Total mesopancreas excision in pancreatic head adenocarcinoma: The same impact as total mesorectal excision in rectal carcinoma? Comment on article "surgical technique and results of total mesopancreas excision in pancreatic tumours" by Adham M and Singhirunnusorn J, *Eur J Surg Oncol*, 2012. *Eur J Surg Oncol* 2012; 38: 725; author reply 726 [PMID: 22525857 DOI: 10.1016/j.ejso.2012.04.001]
 - Gebauer F, Tachezy M, Vashist YK, Marx AH, Yekebas E, Izbicki JR, Bockhorn M. Resection margin clearance in pancreatic cancer after implementation of the Leeds Pathology Protocol (LEEPP): clinically relevant or just academic? *World J Surg* 2015; 39: 493-499 [PMID: 25270344 DOI: 10.1007/s00268-014-2808-4]
 - Wang X, Zhang H, Wang T, Lau WY, Wang X, Sun J, Yuan Z, Zhang Y. The concept and controversy of retroperitoneal nerve dissection in pancreatic head carcinoma (Review). *Int J Oncol* 2015; 47: 2017-2027 [PMID: 26458369 DOI: 10.3892/ijo.2015.3190]
 - Gockel I, Domeyer M, Wolloscheck T, Konerding MA, Junginger T. Resection of the mesopancreas (RMP): a new surgical classification of a known anatomical space. *World J Surg Oncol* 2007; 5: 44 [PMID: 17459163 DOI: 10.1186/1477-7819-5-44]
 - Gaedcke J, Gunawan B, Grade M, Szöke R, Liersch T, Becker H, Ghadimi BM. The mesopancreas is the primary site for R1 resection in pancreatic head cancer: relevance for clinical trials. *Langenbecks Arch Surg* 2010; 395: 451-458 [PMID: 19418067 DOI: 10.1007/s00423-009-0494-8]
 - Peparini N. Resection of the mesopancreas in pancreatic head adenocarcinoma: Is it outside of the International Study Group on Pancreatic Surgery definition and consensus statement for standard and extended pancreatectomy? *Surgery* 2015; 158: 310-311 [PMID: 25704416 DOI: 10.1016/j.surg.2015.01.003]
 - Peparini N, Caronna R, Chirletti P. The "meso" of the rectum and the "meso" of the pancreas: similar terms but distinct concepts in surgical oncology. *Hepatobiliary Pancreat Dis Int* 2015; 14: 548-551 [PMID: 26459733 DOI: 10.1016/S1499-3872(15)60417-9]
 - Chowdappa R, Challa VR. Mesopancreas in pancreatic cancer: where do we stand - review of literature. *Indian J Surg Oncol* 2015; 6: 69-74 [PMID: 25937767 DOI: 10.1007/s13193-014-0294-7]
 - Janot MS, Kersting S, Belyaev O, Matuschek A, Chromik AM, Suelberg D, Uhl W, Tannapfel A, Bergmann U. Can the new RCP R0/R1 classification predict the clinical outcome in ductal adenocarcinoma of the pancreatic head? *Langenbecks Arch Surg* 2012; 397: 917-925 [PMID: 22695970 DOI: 10.1007/s00423-012-0953-5]

- 21 Popescu I, Dumitrascu T. Total meso-pancreas excision: key point of resection in pancreatic head adenocarcinoma. *Hepatogastroenterology* 2011; 58: 202-207 [PMID: 21510315]
- 22 Esposito I, Kleeff J, Bergmann F, Reiser C, Herpel E, Friess H, Schirmacher P, Büchler MW. Most pancreatic cancer resections are R1 resections. *Ann Surg Oncol* 2008; 15: 1651-1660 [PMID: 18351300 DOI: 10.1245/s10434-008-9839-8]
- 23 Bouassida M, Mighri MM, Chtourou MF, Sassi S, Touinsi H, Hajji H, Sassi S. Retroportal lamina or mesopancreas? Lessons learned by anatomical and histological study of thirty three cadaveric dissections. *Int J Surg* 2013; 11: 834-836 [PMID: 23994001 DOI: 10.1016/j.jisu.2013.08.009]
- 24 Cahill RA, Hompes R. Transanal total mesorectal excision. *Br J Surg* 2015; 102: 1591-1593 [PMID: 26694990 DOI: 10.1002/bjs.9933]
- 25 Dimitriou N, Griniatsos J. Complete mesocolic excision: Techniques and outcomes. *World J Gastrointest Oncol* 2015; 7: 383-388 [PMID: 26689921 DOI: 10.4251/wjgo.v7.i12.383]
- 26 Dumitrascu T, Dima S, Popescu I. Update in pancreatic cancer surgery - focus on total mesopancreas excision. *Maedica (Buchar)* 2012; 7: 94-95 [PMID: 23118831]
- 27 Agrawal MK, Thakur DS, Somashekar U, Chandrakar SK, Sharma D. Mesopancreas: myth or reality? *JOP* 2010; 11: 230-233 [PMID: 20442517]
- 28 Peparini N, Chirletti P. Clearance of the retropancreatic margin in pancreatic carcinomas: total mesopancreas excision or extended lymphadenectomy? *Eur J Surg Oncol* 2012; 38: 1146; author reply 1147 [PMID: 22819328 DOI: 10.1016/j.ejso.2012.07.004]
- 29 Adham M, Singhirunnusorn J. Surgical technique and results of total mesopancreas excision (TMpE) in pancreatic tumors. *Eur J Surg Oncol* 2012; 38: 340-345 [PMID: 22264964 DOI: 10.1016/j.ejso.2011.12.015]
- 30 吴文广, 吴向嵩, 李茂岚, 杨桂华, 丁琦晨, 翁昊, 丁倩, 张林, 曹阳, 包润发, 束羿俊, 陆建华, 龚伟, 施伟斌, 顾钧, 王雪峰, 刘颖斌, 全志伟, 彭淑牖. 胰头癌行胰腺全系膜切除75例报告. *中国实用外科杂志* 2013; 33: 80-83
- 31 洪德飞, 彭淑牖, 沈国樑, 成剑, 王知非, 张军港, 黄东胜. 全胰腺系膜切除理念应用于胰头癌根治术的初步体会. *中华普通外科杂志* 2014; 29: 344-347
- 32 Edge SB, Byrd DR, Compton CC, Fritz AG, Greene FL, Trotti A, eds. *AJCC cancer staging manual*. 7th ed. New York: Springer, 2010
- 33 Tempero MA, Arnoletti JP, Behrman SW, Ben-Josef E, Benson AB, Casper ES, Cohen SJ, Czito B, Ellenhorn JD, Hawkins WG, Herman J, Hoffman JP, Ko A, Komanduri S, Koong A, Ma WW, Malafa MP, Merchant NB, Mulvihill SJ, Muscarella P, Nakakura EK, Obando J, Pitman MB, Sasson AR, Tally A, Thayer SP, Whiting S, Wolff RA, Wolpin BM, Freedman-Cass DA, Shead DA. Pancreatic Adenocarcinoma, version 2.2012: featured updates to the NCCN Guidelines. *J Natl Compr Canc Netw* 2012; 10: 703-713 [PMID: 22679115]
- 34 Verbeke CS, Menon KV. Redefining resection margin status in pancreatic cancer. *HPB (Oxford)* 2009; 11: 282-289 [PMID: 19718354 DOI: 10.1111/j.1477-2574.2009.00055.x]
- 35 Regi P, Butturini G, Malleo G, Pedica F, D'Onofrio M, Bassi C. Clinicopathological features of adenosquamous pancreatic cancer. *Langenbecks Arch Surg* 2011; 396: 217-222 [PMID: 20617336 DOI: 10.1007/s00423-010-0677-3]
- 36 Jemal A, Siegel R, Ward E, Hao Y, Xu J, Thun MJ. Cancer statistics, 2009. *CA Cancer J Clin* 2009; 59: 225-249 [PMID: 19474385 DOI: 10.3322/caac.20006]
- 37 Hidalgo M. Pancreatic cancer. *N Engl J Med* 2010; 362: 1605-1617 [PMID: 20427809 DOI: 10.1056/NEJMra0901557]
- 38 Komatsu H, Egawa S, Motoi F, Morikawa T, Sakata N, Naitoh T, Katayose Y, Ishida K, Unno M. Clinicopathological features and surgical outcomes of adenosquamous carcinoma of the pancreas: a retrospective analysis of patients with resectable stage tumors. *Surg Today* 2015; 45: 297-304 [PMID: 24973941 DOI: 10.1007/s00595-014-0934-0]
- 39 Katz MH, Ahmad SA, Boughey JC. Improving resection rates in borderline resectable pancreatic cancer: Pilot study shows favorable results. *Bull Am Coll Surg* 2015; 100: 39-41 [PMID: 26552293]
- 40 Tang K, Lu W, Qin W, Wu Y. Neoadjuvant therapy for patients with borderline resectable pancreatic cancer: A systematic review and meta-analysis of response and resection percentages. *Pancreatol* 2015 Dec 2. [Epub ahead of print] [PMID: 26687001 DOI: 10.1016/j.pan.2015.11.007]
- 41 Mahipal A, Frakes J, Hoffe S, Kim R. Management of borderline resectable pancreatic cancer. *World J Gastrointest Oncol* 2015; 7: 241-249 [PMID: 26483878 DOI: 10.4251/wjgo.v7.i10.241]
- 42 Katz MH, Hwang R, Fleming JB, Evans DB. Tumor-node-metastasis staging of pancreatic adenocarcinoma. *CA Cancer J Clin* 2008; 58: 111-125 [PMID: 18272835 DOI: 10.3322/CA.2007.0012]
- 43 Wang G, Zhou D. Preoperative ultrasound ablation for borderline resectable pancreatic cancer: A report of 30 cases. *Ultrason Sonochem* 2015; 27: 694-702 [PMID: 26113389 DOI: 10.1016/j.ulsonch.2015.05.029]
- 44 Goodman KA, Hajj C. Role of radiation therapy in the management of pancreatic cancer. *J Surg Oncol* 2013; 107: 86-96 [PMID: 22532174 DOI: 10.1002/jso.23137]
- 45 Fujiwara Y, Shiba H, Uwagawa T, Futagawa Y, Misawa T, Yanaga K. Radical resection of a primarily unresectable pancreatic cancer after neoadjuvant chemotherapy using gemcitabine, ts-1, and nafamostat mesilate; report of a case. *Int Surg* 2015; 100: 287-291 [PMID: 25692432 DOI: 10.9738/INTSURG-D-13-00193.1]
- 46 Hackert T, Werner J, Weitz J, Schmidt J, Büchler MW. Uncinate process first--a novel approach for pancreatic head resection. *Langenbecks Arch Surg* 2010; 395: 1161-1164 [PMID: 20582600 DOI: 10.1007/s00423-010-0663-9]
- 47 Okada K, Kawai M, Hirono S, Miyazawa M, Shimizu A, Kitahata Y, Tani M, Yamaue H. A replaced right hepatic artery adjacent to pancreatic carcinoma should be divided to

名词解释

胰腺系膜: 胰腺系膜即胰腺背侧神经淋巴组织层, 包括胰头后方及肠系膜上动脉右侧方的脂肪淋巴组织以及胰腺实质与肠系膜上动脉间的脂肪、血管、淋巴管、神经组织以及引流胰头和钩突部的淋巴结。

■同行评价

本文较为详实地描述了胰头癌达到R0切除时切缘的界定及相关影响因素, 文章描述合理, 观点新颖且正确, 为胰头癌的手术治疗提供文献参考。

- obtain R0 resection in pancreaticoduodenectomy. *Langenbecks Arch Surg* 2015; 400: 57-65 [PMID: 25359559 DOI: 10.1007/s00423-014-1255-x]
- 48 Inoue Y, Saiura A, Yoshioka R, Ono Y, Takahashi M, Arita J, Takahashi Y, Koga R. Pancreatoduodenectomy with systematic mesopancreas dissection using a supracolic anterior artery-first approach. *Ann Surg* 2015; 262: 1092-1101 [PMID: 25587814 DOI: 10.1097/SLA.0000000000001065]
- 49 Aimoto T, Mizutani S, Kawano Y, Matsushita A, Yamashita N, Suzuki H, Uchida E. Left posterior approach pancreaticoduodenectomy with total mesopancreas excision and circumferential lymphadenectomy around the superior mesenteric artery for pancreatic head carcinoma. *J Nippon Med Sch* 2013; 80: 438-445 [PMID: 24419715 DOI: 10.1272/jnms.80.438]
- 50 Moldovan SC, Moldovan AM, Dumitrașcu T, Andrei S, Popescu I. The advantages of retropancreatic vascular dissection for pancreatic head cancer with portal/superior mesenteric vein invasion: posterior approach pancreaticoduodenectomy technique and the mesopancreas theory. *Chirurgia (Bucur)* 2012; 107: 571-578 [PMID: 23116829]

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●消息●

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本刊讯 本刊采用“顺序编码制”的著录方法,即以文中出现顺序用阿拉伯数字编号排序。提倡对国内同行近年已发表的相关研究论文给予充分的反映,并在文内引用处右上角加方括号注明角码。文中如列作者姓名,则需在“Pang等”的右上角注角码;若正文中仅引用某文献中的论述,则在该论述的句末右上角注角码。如马连生^[1]报告……,研究^[2-5]认为……;PCR方法敏感性高^[6,7]。文献序号作正文叙述时,用与正文同号的数字并排,如本实验方法见文献[8]。所引参考文献必须以近2-3年SCIE, PubMed,《中国科技论文统计源期刊》和《中文核心期刊要目总览》收录的学术类期刊为准,通常应只引用与其观点或数据密切相关的国内外期刊中的最新文献,包括世界华人消化杂志(<http://www.wjgnet.com/1009-3079/index.jsp>)和 *World Journal of Gastroenterology* (<http://www.wjgnet.com/1007-9327/index.jsp>)。期刊: 序号, 作者(列出全体作者), 文题, 刊名, 年, 卷, 起页-止页, PMID编号; 书籍: 序号, 作者(列出全部), 书名, 卷次, 版次, 出版地, 出版社, 年, 起页-止页。



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