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·指南解读·

《肝门部胆管癌：米兰专家共识》解读

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摘　要　2025 年 6 月发布的《肝门部胆管癌：米兰专家共识》由全球 71 位专家组成 8 个工作组，基于 570 项研究，采用苏黎世—丹麦共识模型，结合 GRADE 证据分级体系及《牛津循证医学中心证据分级（2011 版）》制定，形成 71 条推荐意见，旨在为肝门部胆管癌（pCCA）的规范化诊治提供循证依据，并明确未来研究方向。该共识系统涵盖 pCCA 的定义与诊断、术前评估与优化、手术策略、肝移植适应证及结局报告标准等关键问题，尤其聚焦外科治疗中的争议焦点及决策路径。本文结合国内外相关指南及作者临床实践经验，对共识的核心推荐进行系统梳理与对比解读，以期为临床医师理解与应用该共识提供参考。

关键词　Klatskin 肿瘤；共识；切缘；引流术；肝移植
中图分类号：R735.7

Interpretation of *recommendations on perihilar cholangiocarcinoma. the Milan jury-based consensus*

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Abstract　The *recommendations on perihilar cholangiocarcinoma. the Milan jury-based consensus*, published in June 2025, was developed by 71 international experts organized into eight working groups. Based on the review of 570 studies, the consensus was formulated using the Zurich-Danish model in combination with the GRADE methodology and the Oxford Centre for Evidence-Based Medicine 2011 Levels of Evidence. A total of 71 recommendations were established to standardize the diagnosis and management of perihilar cholangiocarcinoma (pCCA) and to identify priorities for future research. The consensus comprehensively addresses key aspects of pCCA management, including definition and diagnostic strategies, preoperative assessment and optimization, surgical resection, liver transplantation, and standardized outcome reporting. Particular emphasis is placed on controversial issues in surgical management and decision-making algorithms. In this article, we systematically interpret the core recommendations of the consensus and compare them with existing domestic and international

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guidelines, integrating relevant clinical experience, in order to facilitate their understanding and implementation in clinical practice.

Key words Klatskin Tumor; Consensus; Margins of Excision; Drainage; Liver Transplantation

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肝门部胆管癌（perihilar cholangiocarcinoma，pCCA）目前仍是最具挑战性的恶性肿瘤之一，然而在pCCA的几乎所有领域，包括疾病分期、可切除标准[1-4]和围手术期实践[5]，都缺乏相应的共识。甚至在胆汁淤积患者胆道引流的方式和时机上都存在争议，使得患者在非专业中心得不到最优化的处理，导致严重的后果[5]。因此，迫切需要对证据体系和首选管理策略进行全面准确评估，形成明确的治疗决策共识。2025年6月发表的《肝门部胆管癌：米兰专家共识》[6]（以下简称该共识）是由全球71位专家分为8个工作组，审议了570项研究，采用苏黎世-丹麦模型，参考证据评价与推荐意见分级、制定和评价方法学（grading of recommendations，assessment，development，and evaluation，GRADE），采用《牛津循证医学中心分级2011版》作为辅助工具具体执行证据分级：证据质量分为5个等级，推荐等级分为“强”和“弱”两级（补充表1-2），最终确定了71条推荐意见（补充表3）。该共识针对pCCA的定义和诊断、术前评估和优化、手术切除、肝移植以及结局报告等方面提出了详尽的指导意见，与现有的其他pCCA共识指南相比，该共识更关注pCCA外科治疗方面的相关争议以及未来研究的领域。本文结合笔者自身的临床经验，对该共识推荐的具体内容及国内外相关指南的异同进行了解读和梳理，以便读者更为简便、迅速地理解和应用这些内容。

1 pCCA定义与诊断

1.1 pCCA定义

该共识认为pCCA是起源于二级胆管至胆囊管汇入胆总管之间的原发性胆道恶性肿瘤[7-8]（推荐意见1），而对于判断肝门部胆管肿瘤的解剖学起源有时会比较困难，肿瘤是从肝门部侵犯到肝脏或到胆囊，还是从胆囊或肝内胆管侵犯到肝门部，有时无法判断。国内相关指南对pCCA的定义为起源于肝门周围胆管（肝总管、左右肝管及其汇合部胆管上皮细胞）的恶性肿瘤。国内指南更加详细地指出pCCA是起源于U点与P点之间直至胆囊管汇入胆总管上方的胆管原发肿瘤，但对于肿块型肝内胆管癌，当肿块中心位于U点与P点之间，并累及单侧或双侧肝门部胆管时可被定义为肝门型肝内胆管细胞癌[8]。该共识定义与国内相关指南[9]在定义方面基本一致，但国内指南在解剖界定上描述更为具体。

1.2 影像评估

各专业机构会依据检查的可行性及自身专业水平，选择使用多层螺旋计算机断层扫描（multidetector computed tomography，MDCT）、同时运用磁共振成像与磁共振胰胆管成像（magnetic resonance imaging with cholangiography，MRI/MRCP）和（或）氟-18（^{18}F）氟代脱氧葡萄糖正电子发射断层扫描（^{18}F fluorodeoxyglucose positron electron tomography，^{18}F-FDG PET）来诊断pCCA。但这些检查并没有头对头研究作比较。该共识推荐至少应进行MDCT和MRI/MRCP，因为它们在评估手术可切除性方面是互补的，应结合使用[10]（推荐意见2，8）。高质量的断层成像应在任何胆道干预[包括内镜下逆行胆管造影（endoscopic retrograde cholangiography，ERC）等]之前进行，因为它可以最大限度地减少人为因素导致的图像质量下降，并降低因干预后炎症变化致使诊断误判的风险[11]。增强MDCT的优势在于其高空间分辨率和低运动伪影，可以精确评估肿瘤的水平扩散和血管侵犯。另一方面，MRI提高了对肿瘤沿胆管侵犯范围和肝脏浸润的敏感性的评估[12]，并增加了淋巴结转移评估的准确率[13]。而^{18}F-FDG PET成像在评估解剖学可切除性方面的附加价值有限[14-15]，可根据具体情况用于检测远处转移（其检测敏感度和特异度为70%~75%[16]）（推荐意见2）。国内指南[9]推荐超声检查仅作为筛查手段，增强CT、MRI+MRCP检查是对pCCA诊断、肿瘤分型和分期、可切除性评估和手术规划的主要手段和依据，且二者不可相互

代替，建议有条件的单位同时行增强 CT、增强 MRI+MRCP 检查。笔者认为依据该共识及国内指南针对 pCCA 的术前影像学评估需同时进行增强 MDCT、增强 MRI/MRCP 检查，有条件单位可行 ^{18}F-FDG PET 检查评估有无远处转移。

1.3　肿瘤标志物

糖类抗原 19-9（CA19-9）和（或）癌胚抗原（carcinoembryonic-antigen，CEA）水平虽然对 pCCA 诊断价值较低，但已被确定为局部晚期和肿瘤转移的预测因子[17]。因此，该共识推荐应在诊断时检测血清 CA19-9 和（或）CEA 水平，以评估潜在远处转移的风险（推荐意见 3）。国内指南认为 CA19-9 是一种广泛用于 pCCA 诊断的血液肿瘤标志物，需谨慎解读检测结果；而并未推荐 CEA 检测；对疑似 pCCA 患者，应行免疫球蛋白 G4（immunoglobulin G4，IgG4）相关硬化性胆管炎检测，避免误诊。因为多篇文献报道 IgG4 相关硬化性胆管炎所导致的胆管狭窄被误诊为 pCCA[18-20]，所以对术前无组织学依据疑似 pCCA 患者建议行 IgG4 检测。

1.4　内镜评估

该共识推荐对于疑似 pCCA 的患者，应进行 ERC 联合刷检和活检以获取组织病理学诊断[21-22]。建议针对不明原因的肝门部胆管狭窄，在能够获得胆道充分引流，避免胆管炎的情况下，可以选择使用辅助性胆道内窥镜（如 Spyglass）引导下进行活检取样[23-24]（推荐意见 4）。内镜超声（endoscopic ultrasound，EUS）引导下针对原发灶进行细针穿刺（fine-needle aspiration，FNA）活检，结果提示阳性时准确率很高，但如结果为阴性，并不能除外恶性可能[25]。另外，如果后期考虑行肝移植治疗，则不建议对原发肿瘤进行内镜引导下的 FNA，因为它可能会导致肿瘤种植转移[26]。EUS 引导下的 FNA 被证实有益于识别淋巴结转移，从而指导治疗，但仍会漏掉 34% 左右在手术中证实的淋巴结转移[27-28]（推荐意见 5）。而国内指南[9]指出内镜下逆行胰胆管造影（endoscopic retrograde cholangiopancreatography，ERCP）是有创检查，可能引发出血、胆道感染和急性胰腺炎等严重并发症。同时，因肿瘤促纤维增生特性，诊断特异度高，敏感度较低。因此，ERCP 不被推荐为常规检查，适用于 MRCP 检查显示不清晰或无法施行的情况，或行术前内镜下鼻胆管置入引流术（endoscopic nasobiliary drainage，ENBD）时使用。经皮肝穿刺胆道造影（percutaneous transhepatic cholangiography，PTC）、ERCP、EUS、胆道子镜光纤直视系统、PET/CT 检查可作为 pCCA 诊断中的补充手段。笔者认为，术前获取组织病理学诊断对疾病的诊断至关重要，并且可以借助 ERC 造影及活检进一步明确胆管侵犯范围，为手术方案的制定提供更准确的依据。

1.5　细胞学和组织病理学

该共识指出常规细胞学和经乳头活检具有相似的敏感度和特异度，分别为 20%~40% 和 100%[21, 23-24]。用于多染色体的荧光原位杂交（fluorescence in situ hybridization，FISH）检测敏感度为 60%~70%，特异度约为 95%[23, 29-30]。联合使用细胞学和 FISH 检测可将敏感度进一步提高至 80%[31]，因此该共识推荐联合细胞学和 FISH 检测作为标准检测方法（推荐意见 6）。

通过免疫组织化学和分子技术可以提高细胞学的诊断价值，例如检测 P53 和 Smad4 表达水平的改变，或 TP53、SMAD4 和 KRAS 突变[32]。虽然比较少见，但该共识建议进行特定靶向基因变异的分子分型检测，特别是用于识别 FGFR2 融合和特定 IDH1 功能获得性突变的检测[33]（推荐意见 7）。而国内相关指南并未针对细胞学和组织病理学进行相关描述推荐，笔者认为 pCCA 组织病理学的获得及胆管癌特异靶向基因检测对疾病的诊断及后续治疗至关重要，需要密切关注，可根据该共识进行相关检测。

2　术前规划与手术可切除性

2.1　不可切除与可切除标准

该共识推荐已证实有远处转移性疾病（肝转移、其他器官/部位转移或远处淋巴结转移），或广泛局部侵犯（伴有无法重建的流入道肝门血管侵犯或胆管侵犯无法重建）的患者，应被视为不可切除。一些数据表明，CA19-9≥1 000 U/L 标志着疾病进入进展期，可能无法从手术中获益[34]。合并原发性硬化性胆管炎（primary sclerosing cholangitis，PSC）导致肝脏损害时，也被认为是不可切除的重要因素。此外，手术规划依赖于剩余肝体积（future liver remnant，FLR）和功能[3, 17, 35]。与单纯年龄因素不同[36]，体能状态差被证实是 pCCA 术后

独立预后指标[1, 2, 35-36]。所以该共识还指出FLR或功能不足，或体能状态差的患者，不应考虑手术切除（推荐意见9）。该共识从解剖学（anatomic）、生物学（biologic）和患者状态（conditional）三个方面展示pCCA可切除和不可切除的标准（图1），对于指导治疗决策及选择术前新辅助治疗患者具有重要的指导意义。

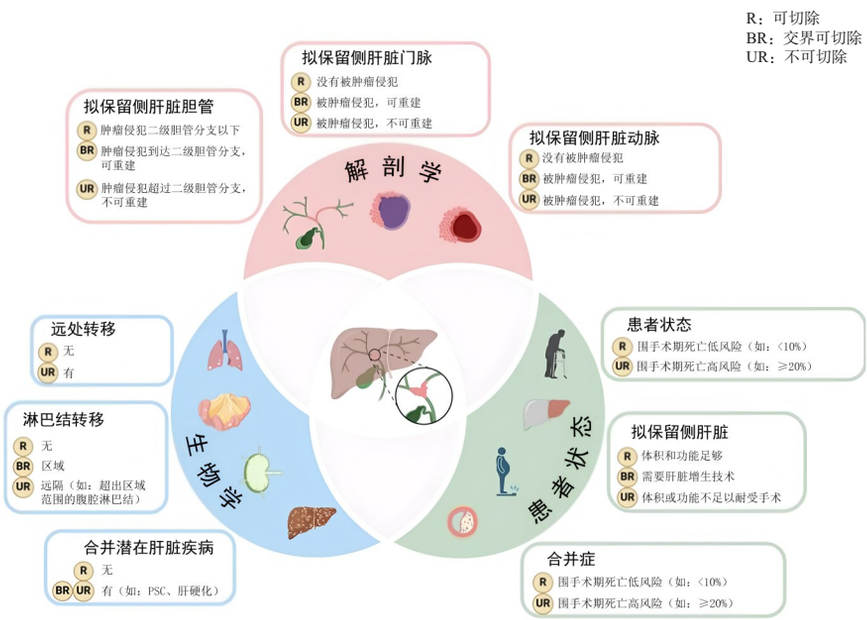

图1 pCCA手术可切除性的综合评估方法[6]

Figure 1 Comprehensive evaluation on approach to determine surgical resectability[6]

国内相关指南与该共识基本一致，但更为详细地指出了胆管切除的左右极限点，右侧肝切除时，极限点在U点左缘B2与B3；左侧肝切除时，极限点在P点附近B6与B7，对于Bismuth-Corlette IV型，若肿瘤超越两侧极限点，则视为不可R_0切除[37]。而门脉切除的极限点为三级分支起始部，肝动脉切除的肝侧极限点为二级分支。笔者认为可结合该共识与国内指南推荐，并重视多学科诊疗（multidisciplinary treatment，MDT）讨论，共同评估其可切除性，制定手术计划。

2.2 术前pCCA分型对可切除性评估的作用

现有的pCCA分型方法均不能准确评估手术可切除性。针对Bismuth-Corlette分型[38-39]及纪念斯隆-凯特琳癌症中心（Memorial Sloan-Kettering Cancer Center，MSKCC）T分期（Blumgart）[38, 40]的研究发现，不同肿瘤分期的可切除率差异很大。而其他的分型系统或依赖于术前无法获得的术后组织病理结果（AJCC TNM分期）[41]，或从未评估过其预测手术可切除性的能力[42-43]。因此，该共识不推荐任何现有的pCCA分期系统来评估可切除性（推荐意见10）。

国内指南推荐采用Bismuth-Corlette分型可对肿瘤累及胆管的部位及范围进行初步评估；MSKCC T分期可评估胆管受累范围、血管受侵犯及肝叶萎缩，为评估手术切除提供参考；AJCC TNM分期可应用于预测患者预后及术后生存时间，并未指出现有哪种分期系统能够准确评估可切除性。综合来看，无法依据现有的pCCA分期系统来准确评估肿瘤可切除性。

2.3 肝实质评估

大多数针对术前肝功能和肝脏体积的评估研究群体为非pCCA患者。少数回顾性研究证实，FLR与体质量比（FLR/BW）[44]、吲哚菁绿15 min滞留率（indocyanine green retention rate at 15 min，ICG R15）[45]、^{99m}Tc-半乳糖基人血清白蛋白（^{99m}Tc-galactosyl-human serum albumin，^{99m}Tc-GSA）[46-47]和^{99m}Tc标记的甲溴芬宁单光子发射CT（single-photon emission CT，SPECT）[48]可以预测pCCA患者的肝切除术后肝功能衰竭（post-hepatectomy liver failure，PHLF）发生风险。该共识推荐在pCCA患者中，应通过体积测量评估FLR（推荐意见11）。肝功能应通过常规生化参数以及功能测试（如ICG R15和^{99m}Tc-GSA或SPECT）进行评估（推荐意见11）。在pCCA背景下，多数患

者伴随胆红素水平升高，由于竞争性胆红素摄取，从而影响ICG、肝脏闪烁扫描法和SPECT的结果。故该共识推荐如果在合并存在黄疸时，这些检查应在胆道引流后进行。

2.4　多学科管理

几项非比较性研究及调查强调了MDT评估对围手术期结局的有利影响[5, 49–50]。在61家欧洲中心中，92%的机构常规进行MDT讨论，目前被认为是一种良好的临床实践[5, 49]。该共识指出参与pCCA患者手术规划MDT的讨论意见对疾病的治疗有益，强烈支持肝病学家、内镜医师、放射科医生、放射治疗师、肿瘤科医生和外科医生共同讨论制定最佳治疗策略（推荐意见12）。国内相关指南同样推荐pCCA的诊治都应进行MDT会诊；如无MDT条件，建议转诊至大容量、有治疗经验的中心进一步治疗。

2.5　分期腹腔镜探查

分期腹腔镜探查有助于发现影像学上隐匿的腹膜播散或微小肝转移[51]。报告的准确率在32%~66%之间，但随着影像技术的进步，这些比率已经下降[52–53]。此外，腹腔镜探查无法确定肿瘤局部进展程度和解剖学是否可切除[54]。因此，该共识推荐在部分选择的患者中进行分期腹腔镜探查，例如临床T3或T4肿瘤或强烈怀疑远处转移的患者，但不推荐在pCCA患者中常规进行分期腹腔镜探查（推荐意见13–14）。国内相关专家共识并未涉及分期腹腔镜探查，仅指出在行移植治疗前需行分期腹腔镜探查，确保无淋巴结和远处转移[55–57]。

3　术前优化处理

术前优化处理在拟行意向性根治手术的pCCA治疗中起着重要作用，可改善患者短期和长期结局，包括术前胆道引流、FLR评估及肝脏增生技术、脓毒症管理和预康复。

3.1　胆道引流

胆道引流可改善黄疸、瘙痒、凝血功能障碍和肾衰竭，同时可能优化术前肝功能和促进肝脏增生[58–59]。然而，最近的Meta分析[60–62]显示了相互矛盾的结果，与未接受胆道引流的患者相比，接受胆道引流的患者并发症发生率更高，但病死率相似。重要的是，这些结果在很大程度上取决于胆红素水平、FLR和肝切除类型[61, 63]。基于此，该共识推荐有以下任一情况的黄疸患者应进行胆道引流：胆管炎、肾功能或肝功能衰竭、严重营养不良、症状严重（如剧烈瘙痒）、FLR较小需要增生技术（推荐意见15）。国内相关指南[9, 64]建议对梗阻性黄疸且同时需行大范围肝切除术（切除肝叶>60%）、合并胆管炎、营养风险大、肝肾功能不全者、拟行新辅助治疗或需行门静脉栓塞（portal vein embolization，PVE）的pCCA患者应考虑给予术前胆道引流；对无症状轻度黄疸患者，可行MDT讨论，综合判断是否需要行术前胆道引流。该共识与国内相关指南基本一致。

该共识推荐如果指征明确，对于确定进行手术切除的患者，应在诊断和分期后尽快进行胆道引流，以便有足够的时间降低胆红素和优化肝脏功能。引流后术前胆红素的最佳阈值仍有争议[65]。胆道引流，无论何种途径，都应根据术前手术规划与外科医生合作进行，目的是仅引流拟保留侧肝脏[66]，应放置塑料支架/引流管或全覆膜可扩张金属支架，以避免影响未来的胆道重建（推荐意见16）。国内指南与此共识推荐一致。

3.2　胆道引流途径

内镜下胆道引流（endoscopic biliary drainage，EBD）或经皮穿刺胆道引流（percutaneous biliary drainage，PBD）在可切除pCCA胆道梗阻中的优越性尚未得到明确证实，并不能证实何种引流途径更好（推荐意见17）。比较EBD与PBD的两项随机对照试验（randomized controlled trial，RCT）[67–68]均提前终止。基于更大规模的回顾性证据[69–70]，国际指南推荐EBD作为主要方式[71]或同等推荐两种方法[72]，但PBD在大多数中心仍然是首选方法[73]。因此，该共识推荐EBD或PBD的选择应基于肿瘤分期、解剖结构、患者特征、当地医生经验和手术可实施性。pCCA患者拟行肝移植前胆道引流应优先EBD方法（如果可行），但PBD也是可接受的，并且与疾病复发无关（推荐意见18，62）。该共识推荐在肿瘤解剖结构允许的情况下，应优先选择EBD，尤其是Bismuth-Corlette Ⅰ型和Ⅱ型pCCA。PBD应考虑用于以下患者：(1) 复杂解剖结构：Bismuth-Corlette Ⅲ型和Ⅳ型pCCA，其中多处胆道梗阻造成EBD入路困难，或存在导致未引流区域感染的风险。(2) EBD失败：由于技术困难或解剖变异。(3) 脓毒症患者：需要紧急胆道减压的胆管

炎或脓毒症，当EBD不可行或延迟时。(4) 解剖结构梗阻：内镜入路因胃肠道解剖结构改变（例如术后改变）而受阻的情况（推荐意见19）。国内指南推荐胆道引流的方法应根据患者情况和医疗技术条件进行选择，优选EBD或PBD。国内指南与该共识基本一致，即使行PBD也可行胆汁回输，促进肠黏膜屏障功能恢复，改善营养状况。

3.3 FLR评估

多数关于FLR评估方法的研究并不是在pCCA中进行的。通常首选使用高质量CT扫描估算FLR，并将其标准化到总估算肝脏体积（total estimated liver volume，TELV）或体质量[44, 74]。而实际测量的总肝脏体积在接受单侧胆道引流和（或）可能因胆道梗阻导致萎缩的患者中准确率下降[75]。基于体表面积（body surface area，BSA）的公式[76]，特别是Vauthey公式[TELV（mL）=1 267.28×BSA（m^2）]计算似乎最准确[77]，所以该共识推荐FLR的评估应通过高质量CT扫描进行，计算其相对于体质量或BSA的TELV数值（推荐意见20）。

虽然>30%的FLR被证实在健康肝实质中是足够的[78-79]，但在合并基础病变的肝脏（如肝硬化、化疗相关肝损伤或持续性胆汁淤积）的情况下，30%的阈值会增加手术风险[80-83]。多中心回顾性研究还发现，术前胆管炎和低白蛋白水平与PHLF发生风险增加相关[73, 84]。因此，该共识推荐对于肝实质健康的pCCA患者，FLR临界值为≥30%，如果FLR<30%，则应进行肝脏增生技术（推荐意见21）。并建议在体弱或有合并症的患者，或有胆管炎、胆汁淤积或营养不良的患者中，将此临界值提高到至少40%（推荐意见22）。国内指南推荐伴有黄疸的pCCA患者若FLR<40%，术前需行肝脏增生技术。

3.4 肝脏增生技术

PVE被证明安全有效，平均FLR增生率为8%~27%，总并发症发生率为3%，死亡率为0[85-86]，该共识推荐PVE作为诱导FLR增生的首选技术[86-87]（推荐意见23）。一旦胆红素水平下降表明引流有效，应立即进行PVE，以降低感染并发症发生的风险[88]。已知的PVE缺点包括未能诱导足够的FLR生长、疾病进展[85-86, 89]，以及在扩大右半肝切除术（H45678）中对肝脏4段进行栓塞时栓塞剂反流至左外叶肝脏的风险[90]。

对于有PVE失败风险的患者[91]，直接或额外追加肝静脉剥夺（liver venous deprivation，LVD）可能是一种可供选择方案，因为与PVE相比，其更能促进肝脏增生且可减少PHLF[92-96]。针对pCCA患者的有限数据[97]显示，与PVE相比，LVD具有更好的改善肝功能作用，且并发症发生率与PVE相似。基于此，该共识推荐对于需要更大肝脏体积增生（FLR<20%~25%、合并基础肝病和（或）扩大右半肝切除术）的患者，应考虑直接或额外追加LVD（推荐意见24）。

尽管联合肝脏分离和门静脉结扎的分期肝切除术（associating liver partition and portal vein ligation for staged hepatectomy，ALPPS）[98]在其他肝脏疾病方面取得了显著肝脏增生效果，但在pCCA患者中仍然会增加并发症发生率和死亡率[99]，目前缺乏ALPPS与其他技术的前瞻性头对头比较研究和RCT。只有最近一项多中心研究[100]（8家中心，n=39）报告了ALPPS在pCCA患者中可接受的短期和长期疗效。因此，该共识推荐将ALPPS在pCCA中的应用限制为在其他增生技术失败时的挽救性手术，而不建议首选ALPPS（推荐意见25）。相比之下，国内相关指南仅推荐PVE作为肝脏增生技术，同样认为ALPPS会增加并发症发生率和死亡率[9, 64]。

3.5 预康复和脓毒症管理

预康复的益处已在大型腹部手术中得到验证[101]，但其在pCCA患者中的具体作用数据有限。研究[102]发现，预康复计划可以改善大型肝脏手术的身体机能、降低并发症发生率和缩短术后住院时间。回顾性研究[103-105]中，术前少肌症/少肌性肥胖是术后结局更差的风险因素。该共识认为这些证据适用于pCCA患者，指出预康复可增强患者对手术应激的抵抗力，并改善术后结局。预康复的组成部分应包括：有效的胆道引流、营养优化、体育锻炼和康复、心理支持（推荐意见26）。

该共识推荐在极少数患者出现脓毒症的情况下，应立即开始治疗，包括紧急胆道引流和启动经验性抗生素治疗。胆道引流与手术之间的时间间隔应在脓毒症得到控制后，并尽可能短（推荐意见27）。所有接受术前胆道引流的患者都应接受适当的抗生素治疗，以控制现有感染或预防感染。在脓毒症情况下，应在等待手术期间根据血液和胆汁样本培养结果调整抗生素治疗。抗生素治疗应在术后持续数天，并根据术中胆汁等样本培养结果进行调整（推荐意见28）。

国内相关指南推荐胆道引流后，常规行胆汁

细菌培养指导围手术期抗菌药物使用，未涉及预康复处理。

4　手　术

该共识推荐联合I段和胆管切除的大范围肝切除术是实现pCCA R_0切除的标准方法[11, 106-107]（推荐意见29）。然而，关于pCCA手术切除的证据体系是回顾性的，包括大型多中心研究[108-109]、一项基准研究以及Meta分析[110-111]。虽然拟切除侧肝脏的判定主要取决于肿瘤解剖学因素[109]，但与左侧肝脏切除相比，右侧大范围肝切除术虽然在肿瘤学上等效，但通常右侧大范围肝切除术的手术相关并发症、PHLF和死亡率比左侧要高[109, 111-113]。因此，该共识指出大范围肝切除术与显著的PHLF和随后的死亡风险相关。由于右侧肝切除术的高风险特征，在同样能达到肿瘤学根治效果的情况下首选左侧肝切除术（H1234-B）[114]（推荐意见30）。

左三区切除技术要求较高且常需联合动脉切除/重建，但对于局部进展期和Bismuth-Corlette IV型pCCA，左三区切除术（H123458-B）[114]在肿瘤学上似乎优于左半肝切除术[115]（H1234-B[114]），并且在PHLF和总生存期（overall survival，OS）方面可能优于右三区切除术[116]（H145678-B[114]）。所以该共识推荐左三区切除术可能是Bismuth-Corlette IV型肿瘤的一种选择，尽管技术要求高且经常需要联合肝动脉切除重建（推荐意见31）。

对于肝功能有限的患者，小范围肝切除术[包括肝门周围的肝（亚）段（1、4、5段）切除联合肝外胆管切除]的假定益处必须与根治性切除的肿瘤学需求相权衡，后者仍然是长期结局的决定性因素。小范围肝切除术有效性的证据仅限于存在严重选择偏倚的小型单中心回顾性研究[117-121]，证据等级较低，通常显示其并发症发生率低于或与大范围肝切除术相当，长期生存无差异。该共识推荐小范围肝切除术（包括肝脏1、4和5段切除联合胆管切除），可能适用于肝功能受损且非进展期肿瘤、肿瘤负荷较轻，并且能够实现与大范围肝切除类似的长期结局以及更低的术后并发症发生率和死亡率的这一类患者（推荐意见32）。

国内指南推荐对于广泛浸润左右肝管二级分支以上但不超过双侧胆管三级分支的部分可获得阴性切缘，且不能耐受大范围肝切除的Bismuth-Corlette IV型pCCA患者，可行尽量保留功能性肝实质的肝中叶切除术。虽然这与此共识不一致，但其只是限定于某些特定不能耐受大范围肝切除患者中，为获得R_0切除而选择此种术式，当然Bismuth-Corlette IV型肿瘤，大部分分期较晚肿瘤负荷较重，行肝中叶切除可能无法获得理想的长期结局，因此只适用于某些特定患者。

4.1　肝脏I段切除

四项回顾性研究的Meta分析和系统评价[110, 122-124]表明，肝脏I段切除联合左或右半肝切除术，可获得更高的pCCA R_0切除率，而并发症发生率/死亡率相似，并且OS更好。因此该共识指出无论是否进行肝脏I段切除，术后并发症发生率和死亡率都是相当的（推荐意见35）。基于此证据，该共识指出，在Bismuth-Corlette III~IV型肿瘤中，半肝切除术联合I段切除增加了R_0切除的机会，能够改善术后OS（推荐意见33）。然而，在Bismuth-Corlette I~II型肿瘤中，肝段I段切除是否获益仍存争议[122-123]（推荐意见34）。

国内指南推荐：由于肿瘤易侵犯左右肝管汇合部和肝尾状叶胆管支，通常情况下应将全尾状叶切除作为pCCA根治性切除手术的必要内容。国内指南指出尽管术前难以准确判断肝尾状叶受累情况，但累及左右肝管汇合处的肿瘤（Bismuth-Corlette II、III、IV型）侵犯肝尾状叶可能性极高。切除肝尾状叶能显著提升R_0切除率，并可能带来更高的5年OS率[125-126]。笔者认为针对Bismuth-Corlette I~II型肿瘤，有待更多多中心RCT研究来比较联合I段切除的疗效。

4.2　淋巴结清扫

pCCA术后淋巴结活检阳性的比例在16%~60%之间，该共识指出淋巴结转移是pCCA根治术后的强预后因素[127-131]（推荐意见36）。阳性淋巴结主要位于肝十二指肠韧带，即第12组（25%），肝总动脉，即第8组（14%），以及胰头后方区域，即第13a组（11%）[132]。因此，该共识建议对第12、8和13a组进行区域淋巴结清扫，清扫数目≥6枚淋巴结（推荐意见37）。然而，扩大淋巴结清扫术（即清扫至腹腔干、肠系膜上动脉、主动脉周围淋巴结）没有益处[133-135]，所以该共识不推荐为获取更多数量淋巴结而进行扩大淋巴结清扫术。国内相关指南淋巴结清扫范围一致，但没有指出具体

清扫淋巴结数目（推荐意见38）。

4.3 血管切除重建

该共识指出血管切除重建增加了晚期肿瘤（cT4）的可切除性。与未进行血管切除重建的肝切除术相比，联合血管切除重建的肝切除术具有更高的PHLF和死亡风险[135-137]。血管切除重建病例的生存比非血管切除重建病例差[135-137]，但优于不可切除病例[136, 138-139]（推荐意见39）。门静脉切除重建影响围手术期安全主要源于早期系列研究，而近期的研究显示并无影响，这些结果表明在有经验的中心进行门静脉切除重建是相当安全的[140]。该共识指出肝动脉切除重建是一项具有挑战性的手术，死亡率较高[140-141]，应在经验丰富的大容量中心进行（推荐意见41）。迄今为止，血管切除重建的异常良好结果在名古屋大学附属病院之外无法复制[138]。

另外该共识指出仅当拟保留侧肝脏的流入道血管紧贴肿瘤时才应进行血管切除重建，不推荐常规行血管切除重建（推荐意见40）。国内指南与此共识一致。

4.4 微创手术

该共识认为微创手术是一种安全可行的方法，由经验丰富的外科医生、在经验丰富的中心、对选定的患者（即Bismuth-Corlette I~III型肿瘤且不需要血管切除的患者）进行时，其结果不劣于开放手术[142-150]（推荐意见42）。国内指南指出微创手术在技术上安全、可行，并未限定肿瘤的Bismuth-Corlette分型，适应证包括Bismuth-Corlette I、II型以及部分III型和IV型（无门静脉及肝动脉侵犯）pCCA，但要求术者拥有丰富的开腹pCCA根治手术经验和娴熟的腹腔镜或机器人操作技巧，远期疗效尚待更多大宗病例RCT进一步验证比较。迄今为止，对于pCCA，尚无腹腔镜与机器人的头对头比较。与最近的国际共识[151]一致，该共识认为与腹腔镜相比，机器人手术在淋巴结清扫和胆道重建方面具有技术优势（推荐意见43），这与国内指南一致。

5 预后与结局评估

5.1 并发症和死亡率

此部分内容国内相关指南并未涉及，该共识支持运用统一的标准化指标来评估手术相关并发症：包括Clavien-Dindo并发症分级[152-154]、查尔森合并症指数（Charlson comorbidity index，CCI®）[154-157]和未能有效救治（failure to rescue，FTR）[158-161]（推荐意见44）。特定的手术并发症应包括PHLF、胆汁漏[162-166]、伤口感染[167]和脓毒症[168]，并应使用指南推荐的定义和分级[162-168]进行监测（推荐意见45）。另外，更广泛的指标，如住院时间、急诊就诊、再入院，以及患者报告结局指标（patient-reported outcome measure，PROM）和患者报告体验指标（patient-reported experience measure，PREM）也应该被纳入，以全面评估总体并发症发生率和死亡率（推荐意见46）。并应建立地区、国家和国际登记库，以增强数据透明度，实现基准比较，并为全球最佳实践作出贡献（推荐意见47）。

5.2 随访

该共识建议将90 d随访作为评估累积并发症的最低期限。建议将标准随访延长至6个月，以包括迟发性并发症（如胆道狭窄和胆管炎[157, 169]），特别是在高风险病例或复杂手术中。建议在6个月后区分并发症相关随访和肿瘤学进展随访[170]，以避免混淆结果（推荐意见48）。在肝移植术后其随访应至少覆盖术后第1年，以监测迟发性胆道并发症[171-173]。国内相关指南并未涉及并发症随访监测。

5.3 良好结局的先决条件

该共识指出改善结局的先决条件包括：(1) 早期转诊至专业中心；(2) 大容量中心以确保具有更丰富的经验，获得更好转归；(3)在复杂肝胆手术方面具有先进的外科手术技术（如胆道重建和血管切除重建技术）[174-176]；(4) 全面的术前优化，包括对FLR和胆道疾病的评估和处理；(5) MDT协作[174-176]；(6) 健全的术后护理方案和完备的并发症处理设施[112, 174-179]（推荐意见49）。

5.4 患者视角

迄今为止，pCCA中以患者为中心的结局报告严重缺乏，只能从一般肝胆恶性肿瘤[180-182]或大型肝切除[183-185]的报告中推断。因此，常规捕捉患者视角被确定为未来研究的基本需求[186]。该共识指出应定期评估患者对术后护理的满意度，重点关注并发症管理、疼痛控制和恢复正常活动等关键方面（推荐意见51）。应在基线、治疗前以及早期和中期恢复期间进行生活质量评估，使用经过验证的工具，随时间捕捉以患者为中心的

结局（即 EORTC QLQ-C30 和疾病特异性模块，如 QLQ-BIL21）（推荐意见 50）。应执行系统收集和分析 PROM 和 PREM，为质量改进计划提供信息并指导以患者为中心的护理策略（推荐意见 52）。目前没有确定的 pCCA 手术治疗后的 PROM、PREM 和生活质量结局预期，但是有可用的生活质量问卷。建议在分析 pCCA 手术治疗后临床结局的任何研究中开发并实施 PROM、PREM 和生活质量结局（推荐意见 69）。该部分内容充分体现了对患者满意度及术后生活质量的重视。

6　围手术期肿瘤治疗

6.1　新辅助化疗（neoadjuvant chemotherapy，NAC）

NAC 的证据主要来源于回顾性[187-188]和前瞻性单中心[189-190]队列研究，重点关注解剖学定义的临界可切除和局部进展期疾病。NAC 方案通常不能改善无病生存期（disease-free interval，DFS）或 OS，但可能使肿瘤缩小提高手术切除率[187]，甚至提高了 R_0 切除率[191-192]。然而，在缺乏疾病局部进展和可切除性标准统一定义的前提下，这些观察结果需要谨慎解读。虽然 NAC 作为提高可切除性的一种策略显示出前景，但需要前瞻性研究来确定其疗效，特别是在临界可切除和局部进展期病例中。所以该共识不推荐对可切除 pCCA 患者进行 NAC（推荐意见 53）。同样，国内指南指出没有证据表明新辅助治疗适用于可切除或临界可切除和局部晚期 pCCA 患者；但是，NAC 可能会提高手术切除率。因此，有必要进行 RCT 研究进一步验证 NAC 能否改善患者的 OS 和无进展生存期。

6.2　辅助治疗

RCT 证实在总体胆道癌群体中辅助化疗有益，但在 pCCA 患者亚组中辅助治疗不能改善无复发生存期（recurrence-free survival，RFS）和 OS[193-196]。另有研究[197-199]证实，在 pCCA 亚组中，辅助方案能够改善患者 OS。该共识推荐对于已切除的 pCCA 患者，推荐进行为期 6 个月的 5-氟尿嘧啶（5-FU）药物辅助治疗（卡培他滨或 S1）（推荐意见 54）。国内相关指南推荐意见一致，建议有必要开展以 pCCA 患者，特别是高复发风险的 pCCA 患者为研究对象的辅助治疗临床试验。

6.3　放射治疗

辅助放疗的疗效仍存争议，研究显示要么没有生存获益[200-202]，要么单独放疗有获益[203-204]，要么联合放化疗有获益[199, 205-206]。原因在于不同研究在患者选择、风险特征和治疗方案方面存在差异。获益尤其出现在 R1[203-206] 和 N1 状态患者中[200-201, 205-206]。然而，放疗在多模式辅助方案中的相对疗效仍未得到证实[199, 201, 205-206]，故而该共识指出对于已切除的 pCCA 患者，不推荐辅助放疗（推荐意见 55）。强调需要进行临床试验以确定放疗在多模式治疗方法中的疗效。国内指南指出对于术后存在阳性切缘（R_1/R_2）或淋巴结阳性患者，术后辅助放疗可以降低患者术后复发率以及改善患者 OS，推荐放疗区域为原发肿瘤瘤床，肝脏切缘，吻合口以及区域淋巴结；需要严格考量放疗剂量与正常组织耐受性。国内指南与该共识的不一致，国内指南引用的一项 Meta 分析[207]显示，对于术后存在阳性切缘或淋巴结阳性患者，术后辅助放疗组的 5 年 OS 率高于无放疗组；同时术后辅助放疗也可改善切缘阴性患者的 5 年 OS 率，术后辅助放疗组的局部复发率显著低于无放疗组[207]。笔者认为可以选择部分患者特别是 R_1 和 N1 状态患者进行辅助放疗，当然更加需要进一步进行临床试验以确定放疗在多模式治疗方法中的疗效。

6.4　靶向治疗和免疫治疗

该共识指出围手术期（新辅助或辅助）靶向或免疫治疗的作用仍处于研究阶段，建议参加临床试验（推荐意见 56）。建议进行分子分型检测以促进未来的靶向治疗，尽管目前尚无已证实的益处（推荐意见 57）。

6.5　局部治疗

关于 pCCA 局部治疗的数据很少。使用光动力疗法的证据仅限于一项系统综述[208]，包括三项研究的数据（两项前瞻性研究[209-210]和一项病例报告[208]，总计 n=16）。基于这些初步的结果，该共识不推荐使用光动力疗法以使 pCCA 转化为可手术；其使用仍处于研究阶段（推荐意见 58）。国内指南仅推荐光动力疗法作为姑息治疗手段。

7　肝移植

7.1　患者选择

大多数研究遵循源于梅奥方案[211-213]的经验性

选择标准，经过严格的纳排标准筛选后联合术前新辅助放化疗，该方案已在一个大型多中心队列（n=214）[214]中得到令人信服的验证结果。基于此，该共识指出pCCA患者基于以下条件可考虑进行肝移植：无移植的一般禁忌证、存在胆囊管上方不可切除的肿瘤（因解剖学因素或合并存在PSC）、肿瘤最大径≤3.0 cm、无淋巴结和远处转移。其他排除标准包括：尝试切除破坏了肿瘤结构、原发肿瘤经腹膜活检阳性（推荐意见59）。患者在纳入肝移植前应进行分期，包括评估区域淋巴结，确保区域淋巴结阴性（推荐意见60）。针对患者选择方面该共识较国内相关指南更详细。

7.2 可切除pCCA

针对可切除的患者，肝移植相较于手术切除的优越性仍然存在争议，虽然肝移植的R_0切除率无疑更高，但并没有明确改善OS[171, 215-217]，所以该共识推荐对于可切除或术前可疑可切除pCCA患者，仅在能够获取活体或死亡供体的情况下，可考虑以肝移植代替切除术（推荐意见64）。

7.3 活体捐赠

近期有共识或指南[218-219]认为，活体肝移植更适合肿瘤患者，活体肝移植后超过50%患者存活超过5年，在pCCA中5年OS为53%[214]。但活体肝移植在血管系统方面存在技术挑战（可能需要动脉和静脉搭桥移植）[220-221]，故该共识推荐在新辅助放化疗背景下，对于早期、不可切除的pCCA，可考虑活体供体和死亡供体肝移植（推荐意见65）。

7.4 新辅助方案

新辅助治疗能够提高等待移植及移植术后pCCA患者OS及延缓或减少肿瘤复发[171, 222-223]。最近的一项标杆研究[45]报告了在移植前未接受新辅助治疗的27例pCCA患者，预后较差。该共识推荐pCCA患者进行肝移植前应接受新辅助治疗（推荐意见61）。因pCCA接受肝移植的患者应接受新辅助放化疗，总剂量为4 500 cGy外照射放疗，同时输注5-FU，随后进行1 500 cGy的近距离放疗加强，然后在移植前至少维持卡培他滨治疗3~6个月（推荐意见63）。国内相关指南推荐不可切除的局部进展期pCCA，可考虑在新辅助放化疗后行肝移植。新辅助治疗方案应包括化疗与放疗的联合应用，与该共识一致。

8 预期结果

8.1 监测

该共识指出目前没有证据表明术后监测具有生存获益，但随着更有效的全身治疗的出现，早期检测可能会有益处[224-226]。如果选择监测，推荐的策略可以基于CT扫描评估，术后第1年每3个月1次，然后每6个月1次至术后5年，对于有异常发现或临床怀疑复发时则采用MRI、PET/CT检查和活检。建议在同一时间点定期监测肿瘤标志物（CEA和CA19-9）（推荐意见66）。国内指南与此一致。

8.2 肿瘤学结局

肿瘤学结局参数应包括RFS和OS。在获得最佳治疗的根治切除pCCA患者中，这两项指标中位数值分别为26个月和53个月[196, 227-228]（推荐意见67）。

8.3 预后因素

该共识指出全面综合评估围手术期的预后影响因素对于改善预后及确定有效的治疗策略具有重要作用（推荐意见68）。大型的回顾性观察性研究证实淋巴结状态[3, 128-129, 198, 229-232]、切缘状态（R_0/R_1）[128, 229, 231]和肿瘤分化程度[3, 229-230, 233]是影响pCCA复发和生存的独立预测因素。此外，一项基于27家中心2 271例患者的分析[234]显示，美国麻醉医师协会（American Society of Anesthesiology，ASA）评分≥3、初诊时胆红素≥50 mmol/L、CA19-9≥100 U/mL、术前胆管炎、门静脉侵犯、肿瘤直径≥3 cm、左半肝切除是无效手术的独立预测因素，应当在临床决策时给予充分考虑。

8.4 肿瘤复发治疗

随机和大型回顾性多中心研究数据表明，顺铂-吉西他滨[226]和度伐利尤单抗+顺铂-吉西他滨方案[225, 235]对整个胆道肿瘤队列有益，但对pCCA患者没有给出结论性结果。基于此，该共识推荐根治性切除术后复发的pCCA患者应考虑化疗（顺铂-吉西他滨）。除非有免疫治疗的禁忌证，否则应考虑加用免疫检查点抑制剂。目前没有数据支持在患有严重自身免疫性疾病（如PSC）的患者中使用免疫检查点抑制剂治疗（推荐意见70）。并且在计划姑息性全身系统抗肿瘤治疗时，推荐进行基因检测（推荐意见71）。国内指南针对晚期pCCA患者推荐五个标准治疗方案，分别是度伐利

尤单抗+吉西他滨联合顺铂、帕博利珠单抗+吉西他滨联合顺铂、吉西他滨联合顺铂、吉西他滨联合替吉奥以及卡培他滨联合奥沙利铂。对于体能状况良好的患者，可以考虑吉西他滨+顺铂+替吉奥三药联合化疗。此外还可以考虑吉西他滨或5-FU为基础的其他两药联合化疗方案。但对复发性肿瘤未给予相关意见。

9　针对pCCA未来研究重点

该共识指出既往关于pCCA研究的证据等级不高，期待更多高水平研究。该共识会议的一项任务是确定需要优先进一步调查和研究的领域。共识强调有必要通过实施大规模的国家和国际注册研究来克服进行前瞻性比较研究的困难，这些注册研究需要收集包括所有治疗策略和所有肿瘤分期的纵向数据。为确保数据质量，定期进行外部审计是不可或缺的。这样的数据库对于评估较少进行及技术上具有挑战性的外科手术（血管切除重建、微创手术、肝移植等）、评估长期肿瘤学结局以及支持试验结果的普遍性尤为重要[236]。前瞻性数据库必须捕捉具有临床相关性的标准化结局参数，并遵守预定的随访期。共识专家团队肯定先前定义此类指标作出的努力[152-159, 162-164, 174, 237]，并特别鼓励优先纳入以患者为中心的结局[182, 238-240]，并通过真实世界、多方利益相关者分析使其形成专属pCCA的数据。共识专家组列出了一些关于pCCA未来研究的领域，详见补充表4。

综上所述，该共识的制定旨在为pCCA的多学科管理建立全面的、基于证据的指导，在pCCA定义和诊断、术前评估和优化、手术切除、肝移植以及结局报告等方面提出了详尽的指导意见，并提出了pCCA未来的研究重点，主要目标是确保pCCA患者得到最佳规范化治疗，改善患者预后。因此，该共识在规范pCCA外科治疗方面具有重要的指导作用，值得深入解读学习。

当然该共识也存在一定局限性，系统全面分析pCCA相关研究，专家组发现关于pCCA研究提供的证据水平存在着显著的异质性。因此，几次共识讨论主要基于专家意见而非经验证据。虽然外科大范围肝切除术目前被确立为治愈性治疗的标准方法，但其支持证据体系仍局限于观察性研究，仅有极少数多中心报告（证据水平4）。全球各机构在处理血管切除等复杂情况方面的经验差异很大，且缺乏普遍性。同样，肝移植主要依赖于少数中心的经验，许多人认为这种方法无效。相比之下，全身肿瘤治疗受益于多中心RCT。然而，这些试验针对的是所有胆道癌队列，而并非仅针对pCCA。这仍然是一个缺陷，因为关于胆管癌基因改变的新证据清楚地表明，肝内和肝外亚型拥有不同的基因表型。故而需要加强国内多中心甚至国际多中心合作，进行多方面pCCA相关RCT，为pCCA的精准治疗提供更多循证医学数据支持。如评估技术上具有挑战性的外科手术（即血管切除、微创手术、肝移植）疗效、局部进展期pCCA转化治疗、晚期或复发pCCA的系统治疗方案优化等。

鉴于各地区医疗条件的差异，该共识中的部分推荐内容可能并不完全适用于所有地区和医疗机构。在中国，临床外科医师应结合地区和医疗机构的实际情况，对部分推荐内容进行批判性解读。对于大容量中心条件可满足情况下，可以尽量依照该共识及国内指南进行pCCA的规范诊治，并批判性评估该共识及指南对临床实践的影响，以确保其转化为有意义的进步。为此，必须通过标准化报告临床结局和系统评价文献来持续评估该共识的实施情况。随着已确定的研究空白逐步得到解决，需要通过后续专家共识讨论进行定期重新评估。这样一个迭代过程能够确保持续改进针对pCCA患者的规范诊治流程。

总体而言，该共识在pCCA外科决策路径、术前优化及围手术期管理方面提供了更加系统化和结构化的推荐，特别是在FLR阈值、肝脏增生策略及血管重建适应证方面较既往指南更为细化。与国内指南相比，其在循证分级体系构建和标准化结局报告方面具有一定优势，但部分推荐仍需结合我国临床资源现状加以审慎应用。未来亟需更多高质量前瞻性研究及多中心RCT，为pCCA的精准分层治疗提供更强证据支持。

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