**Supplementary Table 1: Search terms for PubMed, EMBASE, and The Cochrane Library.**

|  |  |
| --- | --- |
| **Search** | **Query for PubMed** |
| #1 | “Pancreatitis/diagnostic imaging” [Majr] |
| #2 | “Pancreatitis” [TIAB] |
| #3 | “Pancreatic Neoplasms/diagnostic imaging” [Majr] |
| #4 | (Pancreatic [TIAB]) AND (cancer [TIAB] OR cancers [TIAB] OR Neoplasm\*[TIAB] OR Carcinoma\*[TIAB] OR malignan\*[TIAB]) |
| #5 | (#1 OR #2) AND (#3 OR #4) |
| #6 | “Tomography, X-Ray Computed” [MeSH Terms] |
| #7 | CECT[TIAB] OR “contrast-enhanced computed tomography” [TIAB]  |
| #8 | “ultrasonography” [MeSH Terms] |
| #9 | “Contrast-enhanced ultrasound” [TIAB] or “CEUS” [TIAB]  |
| #10 | #6 OR #7 OR #8 OR #9  |
| #11 | “Sensitivity and Specificity” [MeSH Terms] |
| #12 | “Diagnosis, Differential” [MeSH Terms] |
| #13 | Accuracy [TIAB] OR Sensitiv\*[TIAB] OR Specificit\*[TIAB] OR Differential [TIAB] OR “diagnostic performance”[TIAB] |
| #14 | #11 OR #12 OR #13 |
| #15 | #5 AND #10 AND #14 |
| Search | Query for EMBASE |
| #1 | exp pancreatitis/di [Diagnosis] |
| #2 | Pancreatitis. ti,ab,kw. |
| #3 | exp pancreas tumor/di [Diagnosis] |
| #4 | ((Pancreas\* OR Pancreatic) AND (cancer OR cancers OR Neoplasm\* OR Carcinoma\* OR malignan\*)): ti,ab,kw |
| #5 | (#1 OR #2) AND (#3 OR #4) |
| #6 | x-ray computed tomography/exp |
| #7 | (CT OR computed tomography): ti,ab,kw |
| #8 | contrast-enhanced ultrasound/exp  |
| #9 | (Contrast-enhanced ultrasound OR CEUS): ti,ab,kw |
| #10 | #6 OR #7 OR #8 OR #9 |
| #11 | “sensitivity and specificity”/exp |
| #12 | differential diagnosis/exp |
| #13 | (accuracy OR sensitiv\* OR specificit\* OR differential OR diagnostic performance): ti,ab,kw |
| #14 | #11 OR #12 OR #13 |
| #15 | #5 AND #10 AND #14 |
| Search | Query for Cochrane |
| #1 | MeSH descriptor: [pancreatitis] this term only |
| #2 | Pancreatiti\*: ti,ab,kw |
| #3 | #1 or #2 |
| #4 | MeSH descriptor: [Pancreatic Neoplasms] this term only |
| #5 | ((Pancreas\* OR Pancreatic) AND (cancer OR cancers OR Neoplasm\* OR Carcinoma\* OR malignan\*)): ti,ab,kw |
| #6 | #4 or #5 |
| #7 | #3 and #6 |
| #8 | MeSH descriptor: [Tomography, X-Ray Computed] this term only |
| #9 | computed tomography or CT: ti,ab,kw |
| #10 | #8 or #9 |
| #11 | MeSH descriptor: [Ultrasonography, Doppler] this term only |
| #12 | Contrast-enhanced ultrasound or CEUS: ti,ab,kw |
| #13 | #11 or #12  |
| #14 | #10 or #13 |
| #15 | MeSH descriptor: [sensitivity and specificity] in all MeSH products |
| #16 | MeSH descriptor: [Diagnosis, differential] this term only |
| #17 | Accuracy or Sensitiv\* or Specificit\* or Differential or diagnostic performance: ti,ab,kw |
| #18 | #15 or #16 or #17 |
| #19 | #7 and #14 and #18 |
| Search | Query for CNKI/VIP/Wan Fang |
| #1 | “Pancreatitis” [MeSH term] |
| #2 | “Pancreatic neoplasm” [MeSH term] |
| #3 | “CECT” [Title/Abstract] |
| #4 | “CEUS or CE-EUC” [Title/Abstract] |
| #5 | #3 OR #4 |
| #6 | “Diagnosis, differential” |
| #7 | #1 AND #2 AND #5 AND #6 |

**Supplementary Table 2: The detail imaging features for differentiating MFP from PDAC in each individual study.**

|  |  |  |  |
| --- | --- | --- | --- |
| **First author** | **Image features**  | **Sensitivity (%)** | **Specificity (%)** |
| **CEUS** |
| D’Onofrio *et al*[1] | A slight continuous enhancement inside the pancreatic parenchyma  | 88.6 | 97.8 |
| Grossjohann *et al*[2] | Iso-echogenicity of a lesion | 80 | 86 |
| Fan *et al*[3] | Equal enhancement and washout (– iso-enhancement in the early and late stages of enhancement) | 82 | 92 |
| Wang *et al*[4] | Iso-enhancement or iso-enhancement with focal hypo-enhancement in both the early and late phases. | 72.0 | 89.5 |
| Xu and Feng[5] | Hypo-enhancement of a lesions\* | 75.0 | 88.2 |
| Yuan *et al*[6] | Hypo-enhancement of a lesions or equal enhancement and washout for PDAC | 80.0 | 92.3 |
| Li *et al*[7] | Iso-enhancement of a lesions | 77.8 | 100 |
| Xie *et al*[8] | Enhancement equal to pancreas + enhancement pattern: Type II\* | 75.0 | 100 |
| **CECT** |
| Chari *et al*[9] | (1) Low density mass | 15 | 11 |
| (2) Pancreatic duct cut-off | 8 | 33 |
| (3) Distal pancreatic atrophy | 6 | 47 |
| Presence of (1), (2), or (3) | 17 | 8 |
| Focal enlargement without (1), (2), and (3), or normal size pancreas | 31 | 95 |
| Suggestive of liver metastasis | 0 | 81 |
| Diffuse pancreatic enlargement without (1), (2), or (3)\* | 52 | 100 |
| Capsule-like rim around pancreas | 38 | 100 |
| Grossjohann *et al*[2] | Iso-echogenicity of a lesion | 40 | 93 |
| Yamada *et al*[10] | Non-increasing pattern (– a gradual rise throughout the three phases)\* | 83 | 94.1 |
| Brimienė *et al*[11] | Combination features – presence and location of the mass, echogenicity and attenuation of the mass, homogeneity of the mass, presence of extra-pancreatic disease, regional node involvement, presence of hepatic metastases, and ascites | 89.4 | 87.9 |
| Muhi *et al*[12] | Combination of four findings\*The analyzed imaging findings are as follows:early homogeneous good enhancement; delayed homogeneous good enhancement; hypoattenuating capsule-like rim; absence of distal atrophy; MPD upstream dilatation ≤ 4 mm; duct penetrating sign; and ADC ≤ 0.88 × 10−3 mm2/s | 100 | 98 |
| Kawai *et al*[13] | Enhancing duct sign\* | 67 | 90 |
| Wang *et al*[14] | CT value of CMFP | 86.2 | 82.0 |
| Zhu and Lu*[15]* | Combination features – the location\size\density\shape of the lesions; enhancement of the lesions; and regional node involvement, presence of hepatic metastases, and so on. | 90.5 | 81.0 |
| Luo *et al*[16] | Combination features – diffuse parenchymal enlargement; diffuse parenchymal hypo-enhancement; peripancreatic halo or rim; retroperitoneal/para-aortic/paracaval stranding or fibrosis; common bile duct stricture; parenchymal calcifications; parenchymal atrophy; pancreatic ductal dilatation; vascular involvement (celiac axis, SMA, and SMV) | 80 | 77.4 |
| Lv *et al*[17] | Combination features – diffuse parenchymal enlargement; diffuse parenchymal hypo-enhancement; peripancreatic halo or rim; common bile duct stricture; parenchymal calcifications; parenchymal atrophy; pancreatic ductal dilatation; and vascular involvement (celiac axis, SMA, and SMV). | 88.1 | 94.9 |
| Guo [18] | Combination features – diffuse parenchymal enlargement; diffuse parenchymal hypo-enhancement; peripancreatic halo or rim; common bile duct stricture; parenchymal calcifications; parenchymal atrophy; pancreatic ductal dilatation; vascular involvement (celiac axis, SMA, and SMV); and so on. | 89  | 96  |
| Naitoh *et al*[19] | Delayed enhancement\* | 100 | 61 |
| Capsule-like rim | 17 | 100 |
| Sun *et al*[20] | Delayed enhancement > 28 HU\* | 87.5 | 100 |
| Zaheer *et al*[21] | 3-point scale system\*Diffuse parenchymal enlargement; diffuse parenchymal hypo-enhancement; peripancreatic halo or rim; retroperitoneal/para-aortic/paracaval stranding or fibrosis; common bile duct stent; common bile duct wall enhancement; common bile duct stricture; parenchymal calcifications; parenchymal atrophy; pancreatic ductal dilatation; vascular involvement (celiac axis, SMA, and SMV); peripancreatic adenopathy; and non-cystic renal lesions | 68 | 83 |
| Furuhashi *et al*[22] | Combination of 3/7 findings\*Homogeneous enhancement during the portal phase; dotted enhancement during the pancreatic phase; duct-penetration sign; enhanced duct sign; capsule-like rim; absence of a ring-like enhancement; and absence of peripancreatic strands | 91 | 93 |
| Yin *et al*[23] | NIC:NIC = IC lesion/ICaorta = 0.322 in the portal phase. | 93.3 | 89.5 |
| Lee *et al*[24] | 5-point scale system\*Multiple pancreatic masses, discrete pancreatic mass, delayed homogeneous enhancement halo sign, pancreatic duct stricture (abrupt narrowing or tapered narrowing), multiple pancreatic duct strictures, marked upstream pancreatic duct dilatation, upstream pancreatic atrophy, and other organ involvement | 80 | 92 |
| Ren *et al*[25] | Delayed contrast enhancement > 70.5 HU | 84 | 85 |
| Combine model\* | 84 | 95 |
| Linning *et al*[26] | Combination features – capsule-like rim; homogeneous enhancement in venous phase; CT attenuation values of pancreatic lesion (mean ± SD, HU); and extra-pancreatic features | 73 | 88 |
|  |  |  |  |

\*In the case of multiple sets of results due to a use of each individual image feature, the result set with the highest Youden index value was used.

CMFP: Chronic mass-form pancreatitis; CECT: Contrast-enhanced computed tomography; CEUS: Contrast-enhanced ultrasound; MFP: Mass-form pancreatitis; NIC: Normalized iodine concentration; PDAC: Pancreatic ductal adenocarcinoma; SMA: Superior mesenteric artery; SMV: Superior mesenteric veins

**Supplementary Table 3A: Quality assessment of the studies according to QUADAS-2 criteria.**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Studies (first-author)** | **D’Onofrio *et al[1]*** | **Chari *et al[9]*** | **Grossjohann *et al[2]*** | **Yamada *et al[10]***  | **Brimiene *et al[11]*** | **Kawai *et al[13]*** | **Muhi *et al[12]*** | **Naitoh *et al[19]*** | **Fan *et al[3]*** | **Sun *et al[20]*** | **Zaheer *et al[21]*** | **Furuhashi *et al[22]*** | **Yin *et al[23]*** |
| Risk of bias | Patient selection | 😊 | ? | 😊 | 😊 | 😊 | 😊 | ? | ? | ? | 😊 | ☹ | 😊 | 😊 |
| Index test | ? | 😊 | ? | 😊 | ? | 😊 | 😊 | ? | 😊 | 😊 | 😊 | 😊 | 😊 |
| Reference standard | 😊 | ? | 😊 | 😊 | 😊 | ? | ? | ? | 😊 | ? | 😊 | ? | 😊 |
| Flow and timing | 😊 | ☹ | 😊 | ☹ | 😊 | 😊 | 😊 | ☹ | ☹ | ☹ | 😊 | ☹ | 😊 |
| Concerns regarding applicability | Patient selection | ? | 😊 | 😊 | ? | 😊 | ? | 😊 | 😊 | 😊 | 😊 | ☹ | 😊 | 😊 |
| Index test | 😊 | 😊 | 😊 | 😊 | 😊 | 😊 | 😊 | 😊 | 😊 | ☹ | 😊 | 😊 | ☹ |
| Reference standard | 😊 | ? | 😊 | 😊 | 😊 | 😊 | 😊 | 😊 | 😊 | ? | 😊 | 😊 | 😊 |

😊: Low risk; ?: Unclear risk; ☹: High risk. QUADAS-2: Quality Assessment of Diagnostic Accuracy Studies 2.

**Supplementary Table 3B: Quality assessment of the studies according to QUADAS-2 criteria.**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Studies (first-author)** | **Lee *et al[24]*** | **Wang *et al[4]*** | **Ren *et al[25]*** | **Linning *et al[26]*** | **Xie *et al[8]*** | **Yuan *et al[6]*** | **Luo *et al[16]*** | **Xu and Feng*[5]*** | **Li *et al[7]*** | **Lv *et al[17]*** | **Wang *et al[14]***  | **Zhu and Lu*[15]*** | **Guo*[18]*** |
| Risk of bias | Patient selection | ? | 😊 | 😊 | ☹ | 😊 | 😊 | 😊 | 😊 | 😊 | 😊 | 😊 | 😊 | 😊 |
| Index test | 😊 | 😊 | 😊 | 😊 | 😊 | ? | ? | ? | 😊 | ? | ? | ? | ? |
| Reference standard | ? | ? | 😊 | ? | 😊 | 😊 | ? | ? | 😊 | 😊 | 😊 | 😊 | 😊 |
| Flow and timing | ☹ | ☹ | 😊 | ☹ | ☹ | 😊 | ☹ | ☹ | ☹ | 😊 | 😊 | 😊 | 😊 |
| Concerns regarding applicability | Patient selection | 😊 | 😊 | 😊 | 😊 | 😊 | 😊 | 😊 | 😊 | 😊 | 😊 | 😊 | 😊 | 😊 |
| Index test | 😊 | 😊 | 😊 | 😊 | 😊 | 😊 | 😊 | 😊 | 😊 | 😊 | 😊 | 😊 | 😊 |
| Reference standard | 😊 | 😊 | 😊 | 😊 | 😊 | 😊 | ? | ? | 😊 | 😊 | 😊 | 😊 | 😊 |

😊: Low risk; ?: Unclear risk; ☹: High risk. QUADAS-2: Quality Assessment of Diagnostic Accuracy Studies 2.

**Supplementary Table 4: Results of the meta-regression analysis on the CEUS studies**.

|  |  |  |  |
| --- | --- | --- | --- |
| **Covariate\*** | **Subgroup** | **Specificity**  | ***P*-value\*\*** |
| Patients’ numbers | *n* ≤ 50 (*n* = 5) | 95% (90–99%) | 0.24 |
| *n* > 50 (*n* = 3) | 94% (89–100%) | – |
| Publication year | Before 2015 (*n* = 7) | 95% (92–99%) | 0.70 |
| After 2015 (*n* = 1) | 90% (77–100%) | – |
| Image reviewer | Single reviewer (*n* = 2) | 95% (88–100%) | 0.41 |
| Multiple reviewers (*n* = 6) | 95% (90–99%) | – |
| Blinded to read | Clear (*n* = 4) | 96% (92–100%) | 0.79 |
| Unclear (*n* = 4) | 93% (87–99%) | – |
| Reference criteria for MFP | Single criteria (*n* = 3) | 94% (88–100%) | 0.23 |
| Combine two or more criteria (*n* = 5) | 95% (90–100%) | – |
| Reference criteria for PDAC | Histologic criteria (*n* = 4) | 93% (88–99%) | 0.06 |
| Histologic and clinical criteria (*n* = 4) | 96% (92–100%) | – |

\*Factors such as country of publication, sub-type of pancreatitis, were not analyzed due to limited related studies.

\*\**P* < 0.05 has statistical significance.

CI: Confidence index; CEUS: Contrast-enhanced ultrasound; MFP: Mass-form pancreatitis; PDAC: Pancreatic ductal adenocarcinoma.

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