2025

KARNATAKA RADIOLOGY EDUCATION PROGRAM


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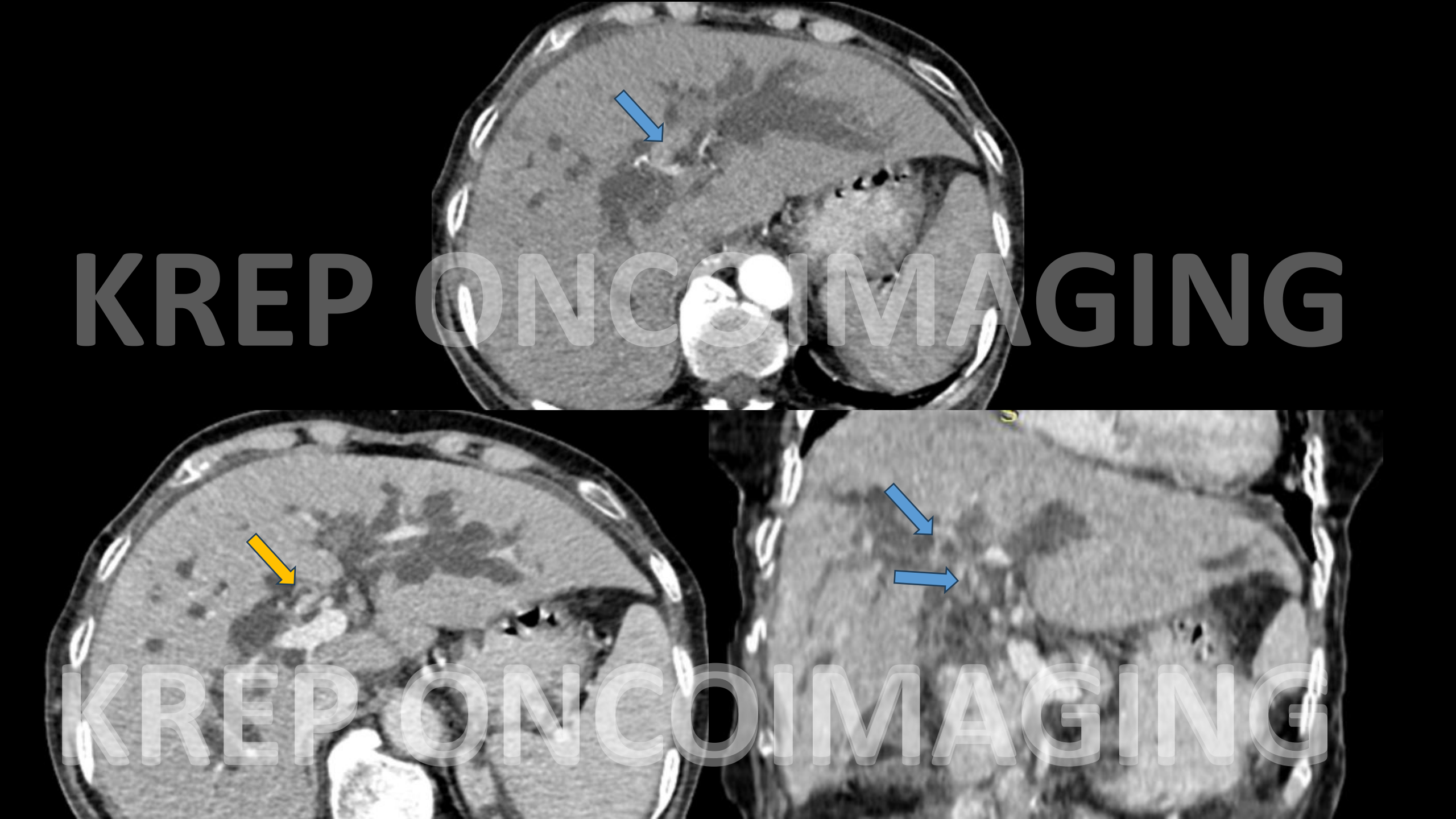
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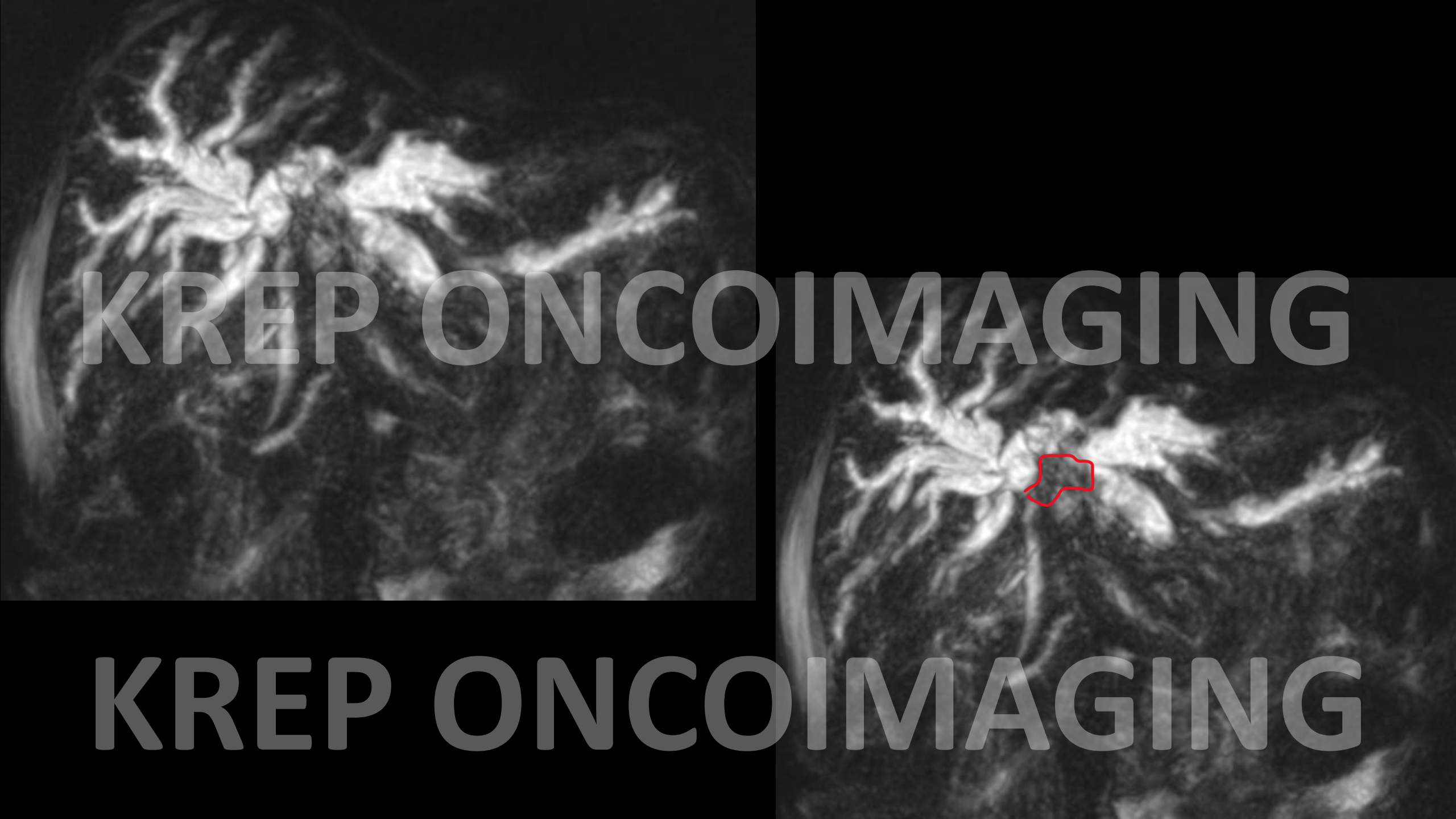
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CECT

- Enhancing lesion at the biliary confluence and CHD (blue arrow).
- The formation of right hepatic duct is not seen with cutoff of right anterior and posterior sectoral ducts; the formation of left hepatic duct is not seen with cutoff of segment 2,3,4 ducts.
- The CHD shows a enhancing lesion with stricture (orange arrow).
- Marked non communicating bilobar IHBRD.
- No obvious significant lymphadenopathy.
  - Features are suggestive of perihilar cholangiocarcinoma. (Bismuth-Corlette type 4)

MRCP

- Cutoff of right sectoral and left segmental ducts, CHD. CBD caliber appears normal.

MANAGEMENT

- **Surgical resection** – only curative option.
- **Biliary drainage:**
  - **PTBD** or **endoscopic plastic removable stenting** for preoperative optimization or palliation.
  - **PTBD (Percutaneous Transhepatic Biliary Drainage - external)** preferred for high hilar obstruction.
- **Liver transplantation:**
  - Option for **unresectable, early-stage, non-metastatic** cases.
- **Adjuvant / Neoadjuvant therapy:**
  - **Gemcitabine + Cisplatin**, ± **radiation / chemoradiation**.
- **Palliative / Locoregional options:**
  - **Endobiliary brachytherapy**, **Photodynamic therapy (PDT)**, or **RFA** for local control and stent patency.

Cholangiocarcinoma (CCA) — Clinical & Imaging Overview

1. Clinical & Disease Context:

- Cholangiocarcinoma (CCA) is a **primary malignancy of the bile ducts**, classified as:
  - **Intrahepatic (i-CCA)** — arises from small intrahepatic bile ducts.
  - **Perihilar (p-CCA, Klatskin tumour)** — at hepatic duct confluence.
  - **Distal (d-CCA)** — in extrahepatic bile duct.
- **Risk factors:** primary sclerosing cholangitis (PSC), hepatolithiasis, liver fluke infection (Clonorchis, Opisthorchis), chronic biliary inflammation, cirrhosis, viral hepatitis, choledochal cysts.
- **Clinical presentation:** jaundice, cholestatic LFT pattern, pruritus, weight loss; often diagnosed late.

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2. Key Pathophysiology:

- Originates from malignant transformation of **cholangiocytes** → progressive **desmoplastic growth** with abundant fibrous stroma.
- Typically shows **progressive (delayed) contrast enhancement** due to fibrosis and limited arterial neovascularity.
- **No arterial washout pattern**, distinguishing it from HCC.

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3. CT/MRI Hallmark Imaging Criteria:

- **Arterial phase:** mild or peripheral rim enhancement.
- **Portal venous & delayed phase: progressive centripetal enhancement** (fibrotic stroma).
- **Capsule:** absent (unlike HCC), but may see retraction of liver capsule.
- **Biliary features:** biliary ductal dilatation, abrupt cutoff, or infiltrative soft tissue at ductal confluence.
- **Lymphadenopathy** (porta hepatis, celiac, peripancreatic) is common.

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4. MRI Specific Characteristics:

- **T1:** hypointense; **T2:** moderately hyperintense.
- **Restricted diffusion:** frequent due to dense tumour cellularity.
- **Hepatobiliary phase (Gd-EOB-DTPA):** hypointense (non-hepatocytic origin).
- **MRCP:** delineates biliary obstruction, level, and pattern of involvement (useful in perihilar disease).

5. Vascular & Invasive Behaviour:

- **Infiltrative growth** into bile ducts, hepatic parenchyma, and adjacent vessels (portal vein, hepatic artery).
- **Perineural invasion** and **lymphatic spread** frequent.
- **Biliary obstruction** with intrahepatic ductal dilatation is a key radiologic clue.

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6. Staging Systems & Imaging Implications:

- **Staging systems:**
  - Intrahepatic CCA: **AJCC TNM (8th ed.)** — number, size, vascular invasion, extrahepatic spread.
  - Perihilar CCA: **Bismuth-Corlette classification** (defines surgical resectability by ductal involvement).
- Imaging evaluates:
  - Extent of biliary and vascular involvement.
  - Regional nodal disease.
  - Metastases (liver, peritoneum, lung).

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7. Treatment-Relevant Imaging Roles:

- **Curative intent:** surgical resection (R0 margin essential) or liver transplantation (strict criteria in early perihilar CCA).
- **Locoregional therapy:** radiofrequency ablation (RFA), TACE/TARE less commonly used than in HCC.
- **Systemic therapy:** gemcitabine–cisplatin ± targeted therapy (FGFR2, IDH1 mutations).
- **Post-treatment evaluation:** look for enhancing residual mass, biliary decompression, and recurrence along ducts or resection margin.

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8. Oncoradiologist Reporting Must Include:

- **Tumour type & location** (intrahepatic / perihilar / distal).
- **Size, morphology (mass-forming, periductal-infiltrating, intraductal).**
- **Biliary involvement:** level, extent, upstream dilatation.
- **Vascular invasion:** portal vein, hepatic artery.
- **Lymph nodes & distant metastases.**
- **Liver parenchymal background** (fibrosis, PSC changes).
- **Post-treatment changes** or complications (stents, biliary drainage).

Contributors

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