

## **A Case Report on the Palliative Role of Intraluminal Brachytherapy (IIBT) in Advanced Hilar Cholangiocarcinoma**

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### **ABSTRACT**

Cholangiocarcinoma (CCA) is the primary malignant tumor of bile ducts which originates from the cholangiocytes. It accounts for 10-15% of all Hepato-biliary malignancies. Hilar Cholangiocarcinoma (Klatskin tumor) is a type of extrahepatic CCA. We present a case of 37-year-old female patient diagnosed with Hilar Cholangiocarcinoma who presented with complaints of loss of appetite since 2 months associated with generalized itching and yellowish discoloration of sclera & skin with palpable firm mass in right hypochondriac region. The patient underwent Percutaneous Transhepatic Biliary Drainage (PTBD) followed by internalization to relieve the biliary obstruction along with Intra Luminal Brachytherapy (ILBT) of 20Gy (4 fractions of 5Gy each). The patient was symptomatically better for 6 months with much alleviation of pain, jaundice and was able to continue with her daily activities. Therefore, it can be concluded by saying that ILBT is an effective modality of treatment in HCCA for alleviation of pain and maintaining patency post PTBD procedure.

**KEYWORDS:** Cholangiocarcinoma, Intra Luminal Brachytherapy (ILBT), palliation, Percutaneous Transhepatic Biliary Drainage (PTBD), advanced.

### **ARTICLE DETAILS**

**Published On:**  
**04 May 2023**

**Available on:**  
**<https://ijmscr.org/>**

### **PURPOSE**

To assess the role of ILBT in palliative management of advanced Hilar Cholangiocarcinoma.

### **INTRODUCTION**

Cholangiocarcinoma (CCA) is the primary malignant tumor of bile ducts which originates from the cholangiocytes. It accounts for 10-15% of all Hepato-biliary malignancies. CCAs are classified into extrahepatic and intrahepatic varieties. Hilar Cholangiocarcinoma (HCCA)/ Klatskin tumor is a type of extrahepatic Cholangiocarcinoma. Most of the cases are sporadic in nature. However there are several established risk factors like parasitic infections, biliary disorders, cholelithiasis etc. Primary sclerosing cholangitis with or without ulcerative cholangitis is the commonest known predisposing factor for CCA. In HCCA, there is primary invasion of portal vein with metastasis to hepatic lobes associated with poor prognosis<sup>[1]</sup>.

Magnetic Retrograde Cholangiopancreatography (MRCP) is the optimal investigation for delineating the hepatobiliary anatomy, assessment of the extent of the bile duct involvement and resectability. Surgical resection is the only

curative therapy. Survival depends on local clearance, vascular invasion. However, most cases are diagnosed in advanced unresectable stages carrying poor prognosis<sup>[2]</sup>.

External beam radiation therapy and intraluminal brachytherapy are the two methods by which tumoricidal doses could be delivered to the malignant area. Achieving tumoricidal doses by external beam radiation therapy is difficult because of the normal tissue tolerance of surrounding organs.

However, intraluminal brachytherapy can help in delivering high dose to the tumor while not exceeding the normal tissue tolerance of surrounding organs. As palliative intent, biliary stent insertion using Percutaneous Transhepatic Biliary Drainage (PTBD) is widely accepted for symptomatic relief. In order to reduce the incidence of dysfunction of biliary stent, RT is recommended<sup>[1]</sup>.

### **CASE REPORT**

A 37-year-old female patient, presented with complaints of loss of appetite since 2 months associated with generalized itching and yellowish discoloration of sclera & skin. On examination, patient belonged to Eastern Co-operative

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Oncology Group Performance Status (ECOG PS) 2. Icterus was present in sclera, palms & soles. On per abdominal examination, a firm, tender mass was elicited in right hypochondriac region. Rest of the clinical examination was normal. Patient underwent MRCP which showed an ill-defined soft tissue mass thickening in the porta hepatis

extending to biliary confluence region measuring 2.5x2.9cm. Extension of the lesion to the neck of gall bladder was also noted. USG-guided FNAC was suggestive of type IV Hilar Cholangiocarcinoma (Figure 1). Henceforth the patient was advised for PTBD procedure followed by ILBT to relieve obstruction.

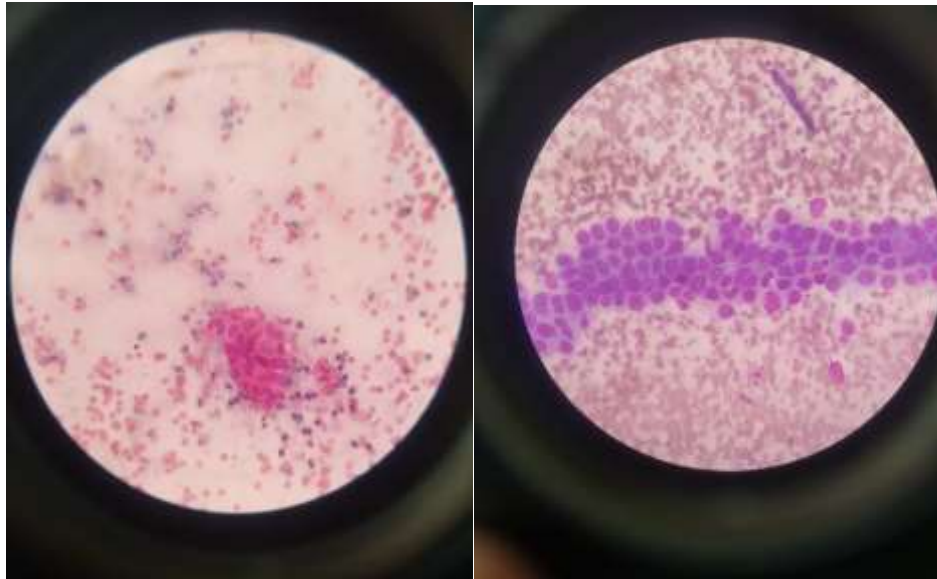


Figure 1: Histological Features Showing Cholangiocarcinoma

### TREATMENT DETAILS

The patient underwent PTBD followed by internalization. To relieve the biliary obstruction & to maintain patency, ILBT catheter insertion was done simultaneously under CT guidance. Once the location and length of the tumor was identified based on MRCP & CT scan, the interventional radiologist placed a 10 French diameter catheter at the tumor site for biliary drainage. Following this, a blind-ended brachytherapy catheter of 5 French diameter was passed through this catheter. Once assured, both the catheters were secured & a lead marker wire was passed through the brachytherapy catheter. A Computed Tomography (CT) scan of 2.5-mm thickness is acquired. The area of interest, Clinical Target Volume (CTV) was contoured and three-dimensional

plans were generated over the CT images after defining dwell points, dwell time and optimization. A dose of 20Gy (4 fractions of 5Gy each) was prescribed at 1 cm depth. The patient received all four fractions & tolerated the treatment well.

### RESULTS

Post-procedure, patient was symptomatically better for 3-4 months with much alleviation of pain & jaundice. There was significant reduction in bilirubin levels by two-fold. She was able to continue with her daily activities. She developed symptoms of loss of appetite with significant weight loss 6 months post treatment. However she was lost to follow-up after 9 months post-ILBT procedure

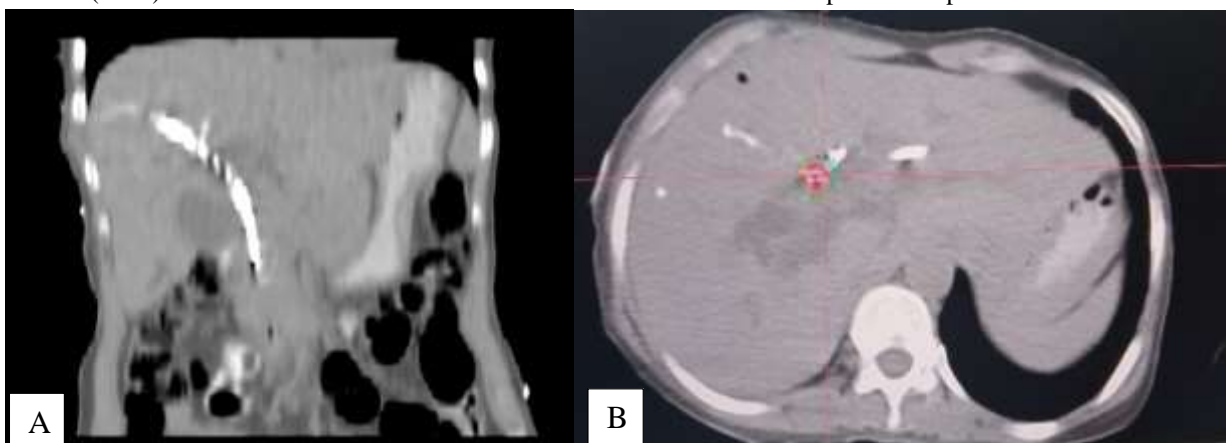


Figure 2a & 2b. Coronal And Axial Section Showing Biliary Stent With Ilbt Catheter In Situ

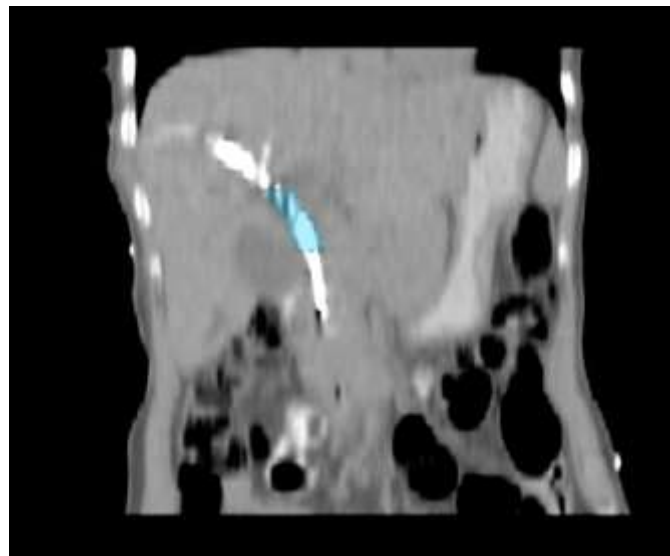


Figure 3. Coronal Section With Ilbt Catheter In Situ Showing The Contoured Clinical Target Volume

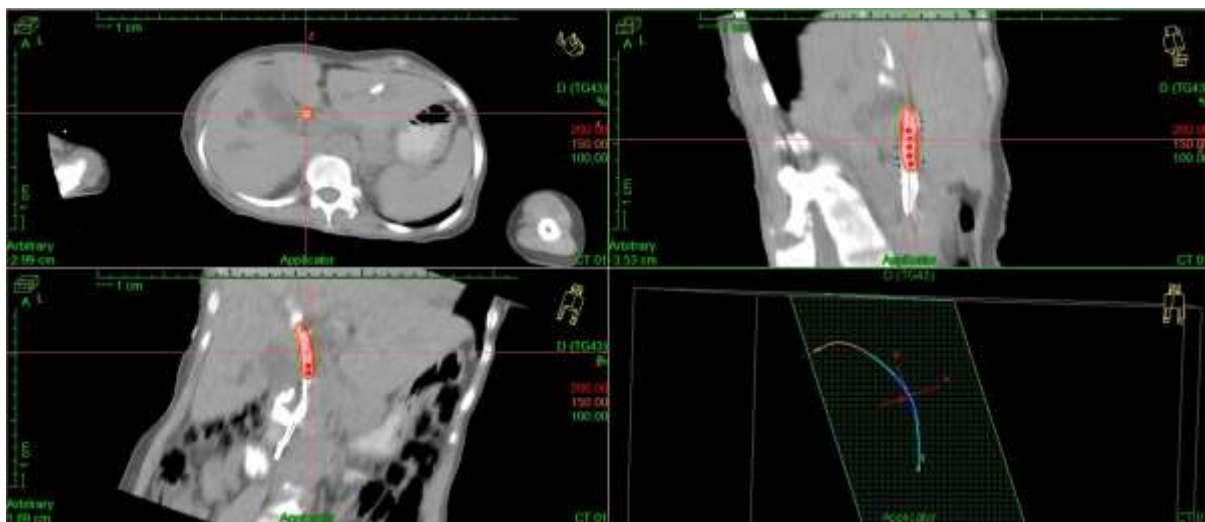


Figure 4. pictures depicting treatment planning for ilbt

LFT REPORTS	PRE-PTBD (mg/dl)	POST-PTBD (mg/dl)
TOTAL BILIRUBIN	17.8	5.3
DIRECT BILIRUBIN	11.10	2.86
TOTAL PROTEIN	6.7	6.0
ALBUMIN	2.77	1.70
INR	1.28	1.30

Figure 4. Liver Function Test Reports Pre And Post Intraluminal Brachytherapy

**DISCUSSION**

Patients with HCCA present with features of progressive obstructive jaundice earlier because of the location of the bile duct confluence. Symptoms include malaise, weight loss, anorexia, nausea, vomiting, pruritus, and right upper quadrant pain. In patients with hilar CCA, intrahepatic bile ducts are dilated, the gallbladder is usually not palpable. The most commonly used imaging modalities are Magnetic Retrograde Cholangiopancreatography ( MRCP).

Surgical excision can only cure a minority of patients, with a 20–30% 5-year survival for distal lesion and a 9–18% 5-year survival for proximal lesions, since most of the cases are

diagnosed at the advanced stages. The management of patients with CCA should be a multidisciplinary approach. Most patients with CCA may not be suitable for surgical resection due presentation at later stages. In particular, RT and biliary stent are the most important types of palliative therapy in advanced hilar cholangiocarcinoma. Biliary stent could solve the cholestasis caused by bile duct obstruction, and ILBT is known to have the ability to improve the prognosis of cholangiocarcinoma by local control of cancer and maintenance of biliary stent patency<sup>[3]</sup>.

ILBT can be done by two methods- percutaneous transhepatic stent technique and trans duodenal endoscopic technique. Of

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both the techniques, percutaneous transhepatic approach is generally preferred. Biliary stent can be implanted under fluoroscopy/CT guidance. The main advantage of PTBD placement is that it provides both internal drainage across the tumor and external drainage at proximal end of the catheter. Some of the acute complications include nausea, vomiting, and transient elevation of transaminases. Gastrointestinal bleeding, biliary bleeding, and stenosis constitute the late complications<sup>[4]</sup>.

A study was conducted by Bruha et al on 32 patients with non-resectable cholangiocarcinoma to evaluate the efficacy of ILBT in maintaining stent patency. The patients received a dose up to 30 Gy. They showed that the duct median patency was maintained for a period of 418 days and it also provided symptomatic relief from the features of obstructive jaundice. The median survival in patients with Klatskin tumor was 457 days. There was significantly 5% increase in survival with the patients who underwent ILBT<sup>[5]</sup>.

Chen et al conducted a study on 34 patients with non-resectable cholangiocarcinoma to evaluate the efficacy of the ILBT on stent patency. HDR-192 Iridium was used with 4-7 Gy every 3-6 days for 3-4 times. The stent patency for the patients who underwent ILBT post PTBD procedure was seen to be 45% in comparison to the patients with no intervention<sup>[6]</sup>.

Aggarwal et al conducted a study on 18 patients with advanced CCA unsuitable for surgical resection who underwent ILBT with 8Gy in 2 session one week apart. They showed a symptomatic relief in terms of nausea, vomiting, icterus, pruritis, dyspnea and loss of appetite post the PTBD procedure<sup>[7]</sup>.

In this case report we have tried to highlight the benefit of ILBT observed in literature in terms of maintaining patency and relieving obstruction as palliative intent. The intention of introduction of ILBT in management of the advanced cholangiocarcinoma should be appreciated in view of much of the symptomatic relief achieved from it.

### CONCLUSION

ILBT is an effective modality of treatment in hilar cholangiocarcinoma for alleviation of pain and maintaining patency post PTBD procedure however with not much significant improvement in overall survival.

### ACKNOWLEDGEMENT

Dr Geeta S.N, Dr S. Narayanan

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