



## Case report

## Multiple bile duct adenomas mimicking hepatic metastases during laparoscopic cholecystectomy - A case report

Duminda Subasinghe<sup>a,b,\*</sup>, Jesuthasan Mithushan<sup>a</sup>, Anjana Abeysinghe<sup>b</sup>, Rachini Withanage<sup>c</sup>, Gayani Ranaweera<sup>d</sup>

<sup>a</sup> Department of Surgery, Faculty of Medicine, University of Colombo, Sri Lanka

<sup>b</sup> University Surgical Unit, The National Hospital of Sri Lanka, Colombo, Sri Lanka

<sup>c</sup> Department of Anesthesiology and Critical Care, Faculty of Medicine, University of Colombo, Sri Lanka

<sup>d</sup> Department of Pathology, Faculty of Medicine, University of Colombo, Sri Lanka

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## ABSTRACT

**Introduction and importance:** Bile duct adenoma (BDA) is a rare benign liver neoplasm, with relatively few cases reported in literature.

**Case presentation:** A 55-year-old man diagnosed with symptomatic gallstone disease who underwent elective laparoscopic cholecystectomy. During the procedure, there were multiple liver nodules mimicking hepatic metastases. Histological examination and contrast-enhanced computed tomography (CECT) of the liver confirmed the diagnosis of BDA.

**Discussion:** When incidental liver nodules are encountered intraoperatively, thorough evaluation is essential to confirm the diagnosis. Structured approach using histological examination and imaging (CECT of the liver/ MRI) confirmed the diagnosis of BDA.

**Conclusions:** BDA is a rare benign liver neoplasm that can be challenging to differentiate from hepatocellular carcinoma or liver metastases. Accurate identification of BDA can prevent overtreatment or mismanagement.

### 1. Introduction

Bile duct adenoma (BDA) is a rare, benign tumor, most often discovered incidentally during laparoscopic surgeries, cross sectional imaging or autopsies [1]. According to Craig et al., bile duct adenoma was found in only five out of 50,000 autopsies [2]. It occurs across all age groups and both sexes, showing no gender predilection. Clinically, BDA is typically asymptomatic and exhibits variable detectability through cross-sectional imaging modalities [1,3]. An ultrasound scan (USS) may depict BDA as a hyperechoic lesion with a hypoechoic rim, though it is often not clearly visualized [4]. In contrast, on contrast-enhanced CT (liver protocol) and Gd-enhanced MRI, BDAs typically appear hyper vascular with arterial-phase and delayed-phase enhancement. The persistent enhancement on dynamic imaging may reflect the presence of fibrous stroma within the tumor [4]. The role of Diffusion-weighted magnetic resonance imaging (DWI-MRI) in evaluating BDA is still emerging. Currently, no specific biomarkers are available for their preoperative identification [5]. This makes it challenging to accurately determine its true incidence.

BDA typically presents as a solitary, subcapsular white or grey nodule measuring 1–2 cm in diameter, composed of proliferating small, bland bile ductules. Histopathologically, it is characterized by unencapsulated nodules with well-defined margins, proliferative uniform ductules embedded in fibrotic connective tissue, and the absence of atypia or mitotic activity [1,6].

Anyhow traditional histopathology alone is often insufficient when immunohistochemical analysis is needed to differentiate bile duct adenoma (BDA), particularly in cases associated with pancreatic or hepatocellular carcinoma. Diagnostically challenging BDAs can be distinguished from metastatic pancreatic adenocarcinoma using albumin b1SH (Branched-chain in-situ hybridization) [7]. Immunohistochemical markers such as CD10, CK19, CK7, and CD56 are typically positive in BDA, whereas AFP and p53 are usually negative [8].

While the exact etiology of BDA remains uncertain, it is widely considered a reactive process to localized injury rather than a true neoplasm [9]. Nevertheless, some cases of BDA have shown progression to cholangiocarcinoma or coexistence with it [10]. The 5th Edition of the World Health Organization (WHO) Classification of Digestive

\* Corresponding author at: Department of Surgery, Faculty of Medicine, University of Colombo, Sri Lanka.

E-mail address: [duminda@srg.cmb.ac.lk](mailto:duminda@srg.cmb.ac.lk) (D. Subasinghe).

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