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## Super giant bladder- 4 litre plus capacity: A case report and review of literature

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### Abstract

**Introduction:** Diseases of the gallbladder commonly manifest as gallstones and gallbladder cancer. Gallstones constitute a significant health problem in developed societies, affecting 10% to 15% of the adult population<sup>1</sup>. In spite of rising incidence of gall bladder pathologies worldwide, incidence of giant gall bladder is very rare.

**Keywords:** Giant gallbladder, Gallbladder disease, cholecysto- cutaneous fistula, Open cholecystectomy, difficult diagnosis, Xanthogranulomatous cholecystitis, XGC

### Introduction

**Case presentation:** 74 yrs. old gentleman, thin built, presented with huge abdominal distension (2 years), pain and fever (3 days). history of jaundice 2 years back, had ERCP for CBD stone. was diagnosed as having large intraabdominal cyst. History of recent needle aspiration of cyst fluid.

### Examination

**General examination:** Revealed thin built old gentleman, toxic look, febrile, dehydrated tachycardia, SPO2 91%, tachypnoeic, bipedal oedema present

### Systemic examination

Per abdomen examination suggested huge abdomen, smooth, equally distended, no visible loops, and peristalsis there was an area of cuticular infection in supraumbilical area with signs of infection. Tenderness all over abdomen Per rectal examination suggested anteriorly boggiess, hot and tender.



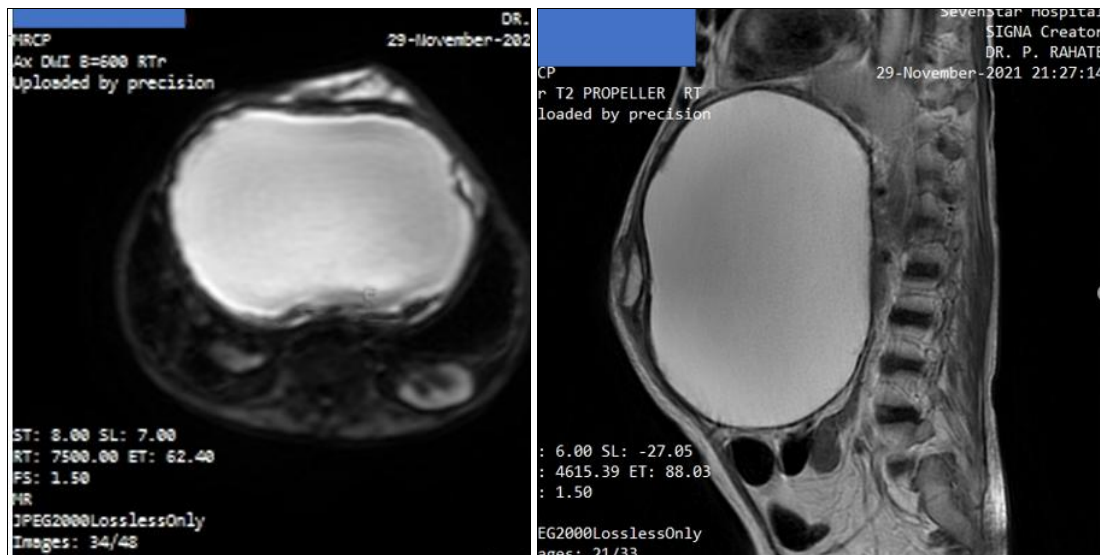
### Investigations

Ultrasonography suggested, large cyst occupying all quadrants, there was leucocytosis, SGOT SGPT and ALP raised, hence MRCP was done. MRCP suggested the cyst was not separate from liver. It is measuring 22.7 x 19.5 x 19.5 cm in maximum craniocaudal, transverse and anteroposterior dimensions. The cystic lesion is predominantly midline and is involving all quadrants of abdomen.

The lesion few thin septations and outpouching on left and right lateral aspects. No evidence of eccentric mural nodule is seen within the lesion.

The approximate wall thickness of the lesion is 3.5cm fluid was thick in consistency with cyst capacity around 4450 ml capacity. organ of origin couldn't be commented because of sheer size of the cyst. gall bladder was not visualised. There was an impending cysto- cutaneous fistula (at the site of needle aspiration) Stent was visible in CBD Intrahepatic

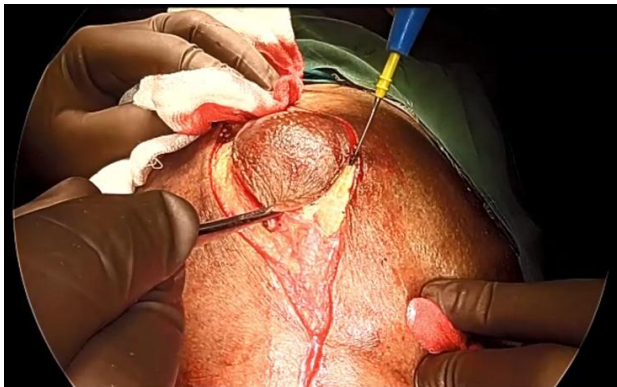
radicles were not dilated (fig 1, 2). with these findings, diagnosis of huge cyst in abdomen with cysto cutaneous fistula was kept and exploratory laparotomy was planned. Since, gall bladder was not visualised, indigo cyanin green dye was injected 90 min before the exploration



**Fig 1, 2:** these findings, diagnosis of huge cyst in abdomen

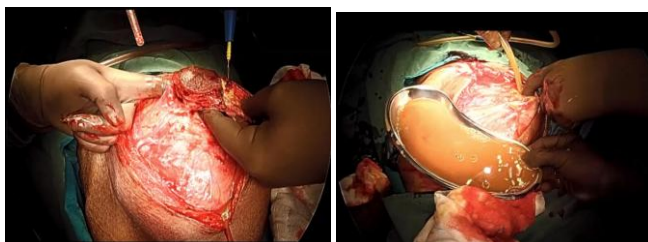
### Exploratory laparotomy

Mid line long incision from xiphoid to suprapubic area, ellipse incision included the midline cysto cutaneous fistula (fig 3)



**Fig 3:** The midline cysto cutaneous fistula

The cyst was occupying all quadrants of abdomen, with pericystic adhesions. (Fig 4). Adhesiolysis done carefully. cyst was adherent to liver segment IV, V, VI, Gall bladder was not seen, rather suspicion grew that the cyst was itself gall bladder. Cyst decompressed to aspirate 4.5 lit. of bilious infected fluid (fig 5)



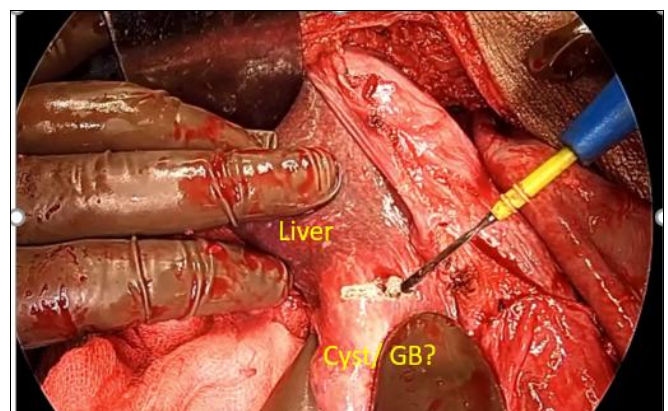
**Fig 4, 5:** Adhesiolysis done carefully of bilious infected fluid

After decompression of complete cyst? gall bladder, callots area searched

Near infra-red imaging of callots area confirmed that the cyst is a gall bladder and defined a long cystic duct entering gall bladder (fig 8). Classical cholecystectomy done. Drain kept in subhepatic space. Patient was in hospital for 6 days. drain removed 4<sup>th</sup> day. Histopathology suggestive of xantho granulomatous cholecystitis.

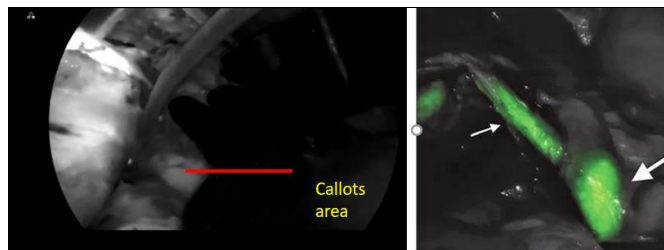


**Fig 6:** Pericholecystic Adhesiolysis



**Fig 7:** Cyst attached to segment V, VI of liver





**Fig 8:** Contrast and NIR imaging of callots area confirmed diagnosis of gall bladder with long cystic duct



**Fig 9:** Specimen along with aspirated 4.5 lit infected bile

## Discussion

### Definition of giant gall bladder

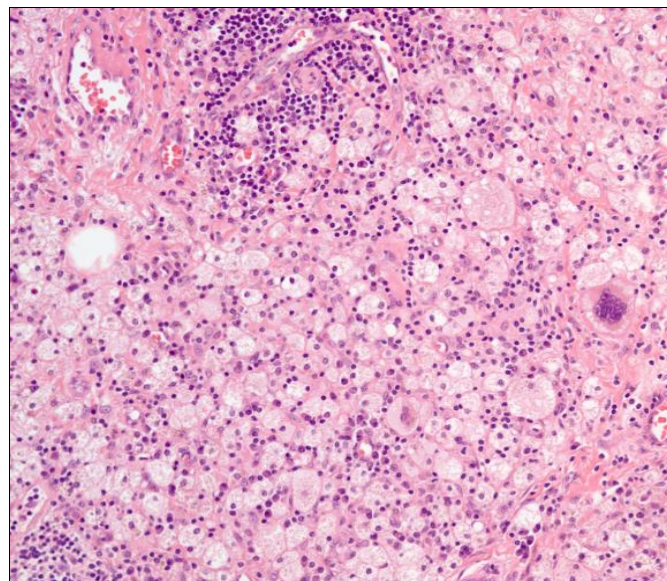
A 'giant' gallbladder is defined as an extreme enlargement of the organ with a volume more than 1.5 Lit., so that its weight is comparable to weight of the adult liver (1.5 kg) <sup>[1]</sup>

### Clinical presentation

Large size of abdomen is the hall mark of clinical presentation. Gradual increase in the size of abdomen over the period of years. weight loss, loss of appetite. pain in abdomen is chronic dull aching. Pain might be absent. Due to absence of pain patient dosent seek medical help. This long history is followed by fever, with or without jaundice and severe pain. At this juncture usually patient take medical help.

Investigations favour diagnosis of huge cyst. Due to its sheer size, organ of origin is usually obscured. leukocytosis, CRP values are high laparoscopy is not possible due to size of cyst and tenseness of abdomen diagnosis of Giant gall bladder is usually intra operative.

The first clinical presentation of the entity will differ from any other gall-bladder disease, but instead resembles a tumour or cyst of the abdominal cavity.

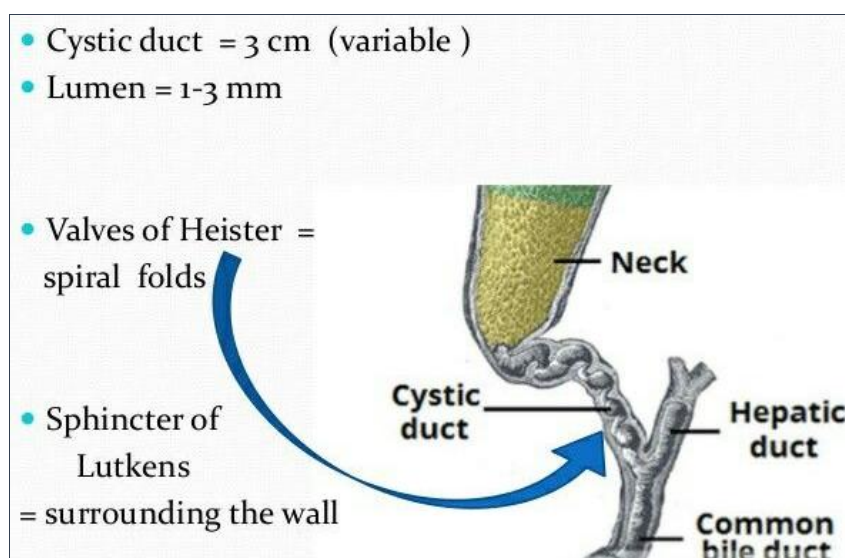


Histopathology suggested XGC characterized by foamy histiocytes and giant cells in the background of chronic active inflammation. Both muscular bundles and connective tissue were hypertrophied markedly.

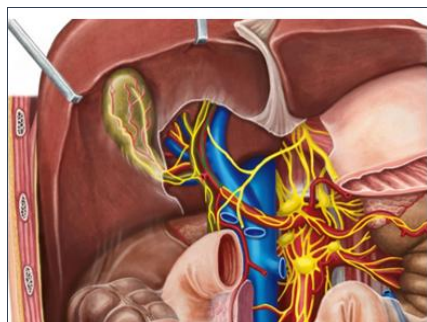
### Why gall bladder grow to gient size?

#### Probable causes

Spiral valves of Heister are undulating folds or valves in the proximal mucosa of the cystic duct. A one-way valve-like mechanism of Heister valves making the gallbladder distend, sometimes a cystic duct stone can also work like one way valve. Non-obstructive ways to alter the organ drainage may exist: nervous, hydraulic, or both.



**Fig 10:** From Pinterest media-cache-ec0.pining.com



The innervation of the liver is governed by the hepatic nervous plexus which runs along the hepatic artery and portal vein. It receives sympathetic fibres from the celiac plexus and parasympathetic fibres from the anterior and posterior vagal trunks. The exact role of the hepatic nervous supply is largely unknown although it does control vasoconstriction.

**Fig 11:** Autonomic nerve supply of gall bladder (courtesy -KENHUB)

In younger patients, congenital anomalies may be considered, such as a local hypogangliosis in the gallbladder neck. This might act as local hypoperistaltic area and adynamic obstruction to gall bladder leading to huge size of gall bladder over the period of years (1) alongside a valve mechanism, there must be exclusively favourable conditions for a gallbladder to become extremely enlarged due to low grade bacterial infection complications, or even significant clinical manifestations: (1) low, if any, bacterial

contamination of the bile in the gallbladder; (2) good vascularization; allowing (3) an appropriate regeneration of the gallbladder wall, allowing it to continue its distension at a steady rate. Perhaps, under conditions where the cystic duct is patent intermittently, an enlarged gallbladder itself might act as a kind of trap for the hepatic bile, allowing it to enter but not exit, and thereby creating a self-reinforcing expansionary process. (1)

**Table 1:** Case reports of giant gallbladders

Publication	Sex	Age	Major co-morbidity	GB <sup>a</sup> size (cm)	GB volume	Patent cystic duct
Petit, before 1750 <sup>1</sup>	Female	27-28	-	?	'2 [Paris] pintes' (about 2 L) <sup>b</sup>	Probably
Van Swieten, 1754 <sup>2</sup>	Mail	12	Very probable	?	'8 libras' (about 2.6 L) <sup>c</sup>	Yes
Collinson <sup>d</sup>	?	?	?	?	12.5 L	?
Neudörfer, 1911 <sup>d</sup>	Female	50	-	?	5.25 L	Yes
Kehr, 1913 <sup>2</sup>	?	?	?	?	1.5 L	?
Borodach et al., 2005 <sup>3</sup>	Female	67	-	20 × 12	1.5 L	Yes
Panaro et al., 2012 <sup>5</sup>	?	17	PFIC-2 <sup>6</sup>	43 × 21	2.7 L	Yes
Liang Zong et al., 2013 <sup>6</sup>	Female	55	-	30 × 18	4.0 L	Yes
Kuznetsov 2014	female	73		24*17*16	3.35 L	YES -
Rahate et al. 2022	male	74	---	22*19.5*22.5	4.5 lit	YES

**Table 2:** Summary of characteristics of current case series and other reported case of large gallbladder stones identified from the review of the literature

Summary of characteristics of current case series and other reported cases of large gallbladder stones identified from the review of the literature.															
Case <sup>a</sup>	Sex	Age	CoMorb	AD	ST	SA	CTO	Ads	GBE	Ebag	Stone			LOS	Histopathology
											Size (cm)	Wt	Comp		
Current series Sudan	F	44	DM	BC	E	LP	N	Y	TU	Y	6 × 4 × 3.3	—	—	1	CC+IM
Current series Philippines	F	41	—	AC	ER	LP	N	Y	SU	Y	4.5 × 3.1 × 3.5	—	—	2	AC
Current series Philippines	M	38	—	CC	E	LP	N	Y	SU	Y	4.1 × 4 × 3.6	—	—	1	Xanthomatous CC
Becerra 2011 Chile	M	57	DM, HTN	AC	ER	OP	NA	—	—	—	16.8 × 7.8 × 4.1	278 g	mixed (Ch, B, Ca salts)	5	AC
Dalal 2014 India	F	38	DM	AC	E	OP	NA	—	—	—	7.4 × 5.4	72 g	mixed (Ch, B)	5	CC
Xu 2013 China	M	70	DM	AC	ER	LP	N	Y	EP	—	9.5 × 6 × 4.5	—	—	3	—
Banigo 2013 UK	F	57	—	BC	E	LP	Y	—	—	—	6 × 3 × 3.5	—	—	3	—
Igwe 2020 Nigeria	F	32	—	AC	ER	LP	N	Y	EP	—	8.2 × 7.5	—	—	7	AC
Ekici 2007 Turkey	F	62	DM, HTN	—	ER	LP	N	Y	SU	—	8 × 6	—	—	3	CC
	M	70	DM, COPD	AC	ER	LP	Y	Y	—	—	10	—	—	5	CC+DMT

Rahate 2022, India M 74 -- CC ER OP N Y -- -- 1 CM -- -- 8 Xanthomatous cc

<sup>a</sup> Due to space considerations only the first author is cited; - not reported; AC: Acute cholecystitis; AD: admitting diagnosis; Ads: Adhesions; BC: Biliary colic; B: bilirubin; C: Cholecystitis; Ca: calcium; CC: Chronic cholecystitis; Ch: cholesterol; CoMorb: comorbidities; Comp: composition; COPD: chronic obstructive pulmonary disease; CTO: conversion to open; DM: diabetes mellitus; DMT: diffuse metaplasia; E: Elective; Ebag: use of endobag to remove gall bladder; EP: Epigastric; ER: Emergency; F: Female; GBE: Gallbladder extraction; HTN: hypertension; IM: intestinal metaplasia; LOS: length of hospital post-op stay (day); LP: laparoscopic; M: male; N: No; NA: not applicable; OP: open; SA: Surgical approach; ST: Surgery type; SU: Supra-umbilical; TU: Trans-umbilical; Wt: Weight; y: years; Y: Yes.

**Author contributions**

Dr. Prashant Rahate was the primary surgeon in the case reported; DR. Zueb Haidar was first assistant surgeon. Dr Vipul Golchha, Dr Belsare, Dr. Rahul Atode and Dr Kunal Yadav assisted in treating the case and has made a review of literature.

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