

# Diagnostic Significance Of Gall Bladder Wall Thickening Seen On Sonography

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Gall bladder wall thickening was observed by sonography in 5% of 3500 patients. Wall thickening was observed in cholecystitis, in association with diffuse liver parenchymal disease and in patients with portal hypertension. Three different sonographic variants of gall bladder wall thickening were seen. In one group of patients a correlation of gall bladder wall thickness and portal vein diameter was seen. It is suggested that gall bladder wall thickening seen sonographically in patients without cholecystitis is an early indication of portal hypertension.

**Key Words:** Gall bladder, Ultrasonography.

With modern ultrasound equipment the gall bladder is well visualized, not only the size but wall thickness can be measured in millimeters and also comments made on its echogenicity and sharpness.

Lately keen interest has developed, in relation to sonographically detected gall bladder wall thickness as a useful diagnostic sign. Initially it was thought that gall bladder wall thickness was only associated with cholecystitis acute and chronic (Manchal G et al.) However later other authors noted gall bladder wall thickness in conditions other than cholecystitis, like alcoholism, hypoalbumenia, ascities and chronic diffuse liver disease.

## Material and Methods.

The present study was carried out over a period of 2 years, and 3500 patients were examined sonographically who were referred to the Radiology Department, Mayo Hospital, for abdominal ultrasonography for a variety of indications. The ages of patients ranged from 20-80 years. All 3500 patients irrespective of diagnosis and indications for sonography were subjected to ultrasonography of the liver and gall bladder with particular reference to gall bladder wall thickness. Wall thickness was measured along the anterior surface of gall bladder. Also the wall was evaluated for the homogeneity and sharpness. A wall thickness of upto 3 mm was considered normal. The spleen, pancreas, kidney were also examined in these patients. In all cases of chronic heart insufficiency, ascities, splenomegaly, hepatomegaly or other sonographic signs of diffuse liver disease. The portal vein diameter was measured in the extrahepatic part in the hepatoduodenal ligamentum. The diameter of splenic vein was measured at the splenic hilum. Normal diameter of portal vein in healthy individuals is 12 mm and normal splenic vein is not more than 9 mm.

Examination was carried out by a Toshiba SAL 38 AS scanner with 5.0 Mhz sector after 12 hour of fasting by the patient. Measurement were recorded on thermal paper.

## Results and Discussion.

Gall bladder wall is visualized as an echogenic margin encircling a fluid filled lumen Wall thickness is healthy individuals did not exceed 3 mm. In most cases it averaged 2 mm. Out of 3500 patients examined, in 18 cases the measurement of the wall thickness was not possible, in 5 cases the measurement was doubtful as the margin was not sharp. Among these 23 case:

- 4 suffered from acute cholecystitis.
- 2 suffered from acute viral hepatitis.
- 14 had calculus cholecystitis.
- 2 cases had biliary sludge.
- 1 case had gross obesity.

**Table -I** Gall Bladder thickness in 3500 different patients.

Thickness Measured	No of Patients.
Upto 3 mm	3340
4 mm	74
5 mm	36
6 mm	20
7-12 mm	22
Above 12 mm	08

Significantly thickened gall bladder wall was detected in 135 cases of 3500 patients. Three types of diffuse gall bladder wall thickening were seen .

1. Wall thickening in form of one echogenic layer.
2. Wall thickening consisting of 3 layers of which middle layer is echogenic.
3. Indistinguishable echotexture of wall and difficult to differentiate layers of wall

In 5 cases diffuse gall bladder wall thickening was correlated with small polyps. Two of them had ascities and wall thickness of 5-6 mm and 3 patients had wall thickness of 4 mm. Besides acute and chronic cholecystitis gall bladders wall thickening was seen in other cases. The following observation of wall thickness was seen:-

Chronic cholecystitis (44 patients), acute cholecystitis (26 patients) diffuse lesion of liver parenchyme without

Table II

No	Group of Patients (n=44)	Wall Thickness in mm
1.	Chronic cholecystitis (n=44)	4.66 ± 0.41
2.	Acute Cholecystitis n= 36	5.69 ± 0.63
3.	Diffuse liver disease without ascities and signs of portal hypertension n=16	4.25 ± 0.23
4.	Disseminated liver growth without ascities n=10	4.80 ± 0.56
5.	Disseminated malignant growth with ascities n=8	5.13 ± 1.06
6.	Syndrome of portal hypertension without ascities n=8	5.25 ± 1.06
7.	Syndrome of portal hypertension with ascities n=5	0.40 ± 3.10
8.	Chronic heart insufficiency n=7	4.29 ± 0.70
9.	Sepsis n=3	4.4
10.	Acute viral hepatitis.	4.1

icterus or signs of portal hypertension (16 patients) disseminated malignant growth with ascities (8 patients), lymphoma of portal lymphnodes with ascities (5 patients), Sepsis (3 patients). acute viral hepatitis (2 patients).

Table-III:

No	Group of Patients	n=44	Wall Thickness in mm
1.	Chronic cholecystitis (n=44)		4.66 ± 0.41
2.	Acute Cholecystitis n= 36		5.69 ± 0.63
3.	Diffuse liver disease without ascities and signs of portal hypertension n=16		4.25 ± 0.23
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8.	Chronic heart insufficiency n=7		4.29 ± 0.70
9.	Sepsis n=3		4.4
10.	Acute viral hepatitis.		4.1

135 patients with gall bladder thickness more than 3 mm are included in Table II.

Also correlation between gall bladder wall thickness and diameters of portal and splenic veins was analysed and following results obtained:-

### Conclusion:

The diameter of portal vein increases with increase of pressure in portal vessel. A correlation between gall bladder wall thickness and portal vein diameter was detected in all four group of patients (Table-II) As the diameter of portal vein correlates to some extent with pressure in portal system, it can be supposed that increase in gall bladder thickness is associated with increase in pressure in portal vein and not hypoalbuminemia in above mentioned groups of patients it is possible that sonographic detection of gall bladder wall thickness in patients with diffuse lesion of liver parenchyma without cholecystitis can suggest early portal hypertension .

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