Observations On Protracted Cystic Duct Obstruction With Hydrops

William S. Haubrich
Melvin A. Block

Follow this and additional works at: https://scholarlycommons.henryford.com/hfhmedjournal

Part of the Life Sciences Commons, Medical Specialties Commons, and the Public Health Commons

Recommended Citation
Available at: https://scholarlycommons.henryford.com/hfhmedjournal/vol5/iss2/10

This Article is brought to you for free and open access by Henry Ford Health System Scholarly Commons. It has been accepted for inclusion in Henry Ford Hospital Medical Journal by an authorized editor of Henry Ford Health System Scholarly Commons. For more information, please contact acabrer4@hfhs.org.
OBSERVATIONS ON PROTRACTED CYSTIC DUCT OBSTRUCTION WITH HYDROPS

WILLIAM S. HAUBRICH, M.D.*, AND MELVIN A. BLOCK, M.D.**

Hydrops denotes a large gallbladder distended with fluid resembling water. The condition is dependent on 3 requisites: a) complete and unyielding obstruction of the cystic duct, usually by stone, b) the absence of infection, and c) a gallbladder wall capable of distention and retaining a degree of permeability with relation to circulating blood plasma.

In the modern era of emphasis on prompt surgical correction of biliary tract obstruction, such a set of conditions is seldom permitted to persist. A remarkable instance in which hydrops evidently existed for approximately 6 years is herewith recorded.

REPORT OF CASE

HFH Case No. 318237: A 38 year old white housewife complained of "a lump in my side". Eight years earlier she had been seen at this hospital because of upper abdominal distress compatible with biliary "colic". At cholecystography the gallbladder had failed to visualize. Surgical intervention was advised. In making this recommendation, the physician unfortunately used the term "exploratory laparotomy". Apparently this carried a connotation too indefinite and inconclusive for the patient. Thanking him for his efforts, she departed and did not return.

Two years later, while turning on her left side in bed, the patient herself palpated a firm, smooth, non-tender, globular mass in the right hypochondrium. Thereupon, she consulted her family doctor who (allegedly without examination) indicated the mass might be her kidney and suggested that she consult a urologist. The urologist, in turn, following normal pyleography, assured her there was no disease in the kidneys. Armed with this information, and because the mass was quite asymptomatic, the patient dismissed her concern. Nevertheless, each time she chose to do so, she could easily palpate the unchanging "lump". Curiously, there was no recurrence of colicky pain, and only recently had the patient been aware of a slight soreness below the right rib margin.

Physical examination of this slender woman readily disclosed a prominent, globular mass in the right hypochondrium. The mass was only slightly tender and followed a full excursion with each breath. Laboratory data, including urinalysis, hemogram, serum bilirubin and alkaline phosphatase, were unremarkable. Diagnostic biliary drainage yielded no specimen which could be identified as "B-bile"; the duodenal aspiration contained no cholesterin crystals or bilirubinate pigment. Despite a "double-dose" of Telopaque, the gallbladder was not visualized at cholecystography.

On this occasion the patient readily accepted the recommendation for cholecystectomy. At operation a large, turgid, distended gallbladder was encountered. In order to facilitate dissection prior to resection the surgeon was obliged to aspirate 200 ml. of faintly opalescent, colorless, serous fluid (Figure 1). In addition, the gallbladder

---

*Division of Gastroenterology
**Division of General Surgery
Figure 1. Serous, faintly opalescent fluid aspirated from the hydropic gallbladder; its contents are enumerated in Table I.

Figure 2. Thin walled, hydropic gallbladder opened along its longitudinal axis.
Cystic Duct Obstruction

contained more than 50 small to medium-sized, faceted, mottled yellow and brown concrements. The cystic duct was of normal calibre; several stones were incarcerated within the cystic duct completely obstructing its lumen. The opened gallbladder measured 16.5 cm. in length, 9 cm. in circumference. Its wall was thin but fibrotic; the mucosal surface was smooth, dull, and grey (Figure 2).

The common bile duct and liver were grossly normal. An orthodox cholecystectomy was performed. The post-operative course was uneventful.

DISCUSSION

What happens in a gallbladder deprived of bile by protracted cystic duct obstruction? Given the 3 conditions previously enumerated, the answer hinges on the normal physiologic function of the gallbladder. Finally, this function may be modified by varying degrees of disease within the gallbladder wall.

In Table I a comparison is invited between the relative concentrations of various constituents making up the contents of the hydropic gallbladder herein described, "normal" gallbladder bile, and plasma. It seems reasonable to assume, if the gallbladder wall retains any permeability, that an equilibrium is established between the lumen of the gallbladder and blood plasma coursing through the bladder wall. That this equilibrium is not attained by simple diffusion is indicated by the discrepancies in concentrations listed in Table I.

| Table I |
|-----------------|-----------------|-----------------|
|                | Contents of Hydropic Gall Bladder | "Normal" Gall Bladder Bile* | Plasma |
| Sodium (mEq/L) | 144              | 145              |        |
| Potassium (mEq/L) | 4.9              | 4.8              |        |
| Chloride (mEq/L) | 162              | 16—19            | 105    |
| Uric Acid (mg/100 ml) | 17              | 3                |        |
| Protein (Gm/100 ml) | 0.012            | 7                |        |
| Bile Salts (per cent) | 0               | 2—9.7            | 0      |
| Calcium (mg/100 ml) | 5               | 25—28            | 10     |
| Cholesterol (mg/100 ml) | 0               | 160—540          | 180    |
| pH               | 6.5              | 6.9—7.7          | 7.3    |


As expected, sodium and potassium are isotonic. Chloride is relatively increased to make up the acid-base balance. Protein is apparently excluded from the gallbladder
lumen. Uric acid is unaccountably high. Bile salts are apparently absorbed. The con­centrations of 2 common constituents of gallstones are of particular interest: cholesterol is absent from the hydropic fluid, and calcium is relatively low. The evidence from this one instance may suggest that the hydropic gallbladder is incapable of forming concrements of the usual type.

That the hydropic gallbladder may attain a gigantic size is substantiated in a report by Collinson of a patient whose gallbladder became so large that abdominal paracentesis was performed (yielding 25 pints of fluid!) because of an erroneous diagnosis of ascites. The abdomen of this patient had gradually enlarged over 2 years; she eventually recovered after removal of the gallbladder. Terrier cited the removal of over 42 pints of fluid from a gallbladder. Abdominal distention in this patient over 8 years had produced dyspnea. Evidence of hydrops existing for 12 years was reported by Doran. The gallbladder of this patient contained one liter when resected. Waring described a tremendously distended gallbladder, the lower part of which passed through the right femoral ring forming the contents of a hernial sac.

Why is cystic duct obstruction in some patients followed by hydrops while in others it is followed by the formation of thick, pasty, “milk-of-calcium” bile? In 1887 Birch and Spong reported studies on 2 patients for whom cholecystostomies had been performed because of cystic duct obstruction and in whom the gallbladder mucosa was considered normal. In each 24 hours these gallbladders secreted approximately 20 ml. of clear, watery, slightly alkaline fluid which contained mucin, chlorides, carbonates, and phosphates, but no bile salts. On the other hand, secretion of calcium salts into the obstructed gallbladder may lead to precipitation of “milk-of-calcium” bile or calcification of the gallbladder wall.

It has been our experience that the obstructed gallbladder containing “milk-of-calcium” bile is invariably a small, shrunken gallbladder the wall of which is obviously and grossly diseased. In hydrops the wall is thin and the mucosa intact. It would appear, therefore, that the differential absorption and secretion by the gallbladder wall is a function of the inflammatory disease within that wall.

SUMMARY AND CONCLUSIONS
Protracted, complete cystic duct obstruction may result in relatively asymptomatic hydrops of the gallbladder. A case in which such obstruction was evident for 6 years is described. The sequence of differential absorption and secretion by the gallbladder wall following cystic duct obstruction seems to be determined by the extent of prior disease within that wall.

BIBLIOGRAPHY