

# Intramural Hematoma of the Duodenum \*

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INTRAMURAL hematoma of the duodenum usually follows trauma of the abdomen, but may occur spontaneously and in patients with increased bleeding tendencies. This condition has been recognized only recently as a distinct entity, and we believe that our cases should be reported and treatment discussed to call the clinician's attention to the possibility of this diagnosis in patients with signs and symptoms of high intestinal obstruction.

Extravasation of blood into the submucosal or subserosal layers of the duodenum may produce partial or complete obstruction of the duodenum. The first report of intramural duodenal hematoma obstructing the duodenum was made by McLaughlan, in 1838.<sup>14</sup> In 1894, Perry described a tense, dark blue, upper abdominal mass which was found to be a hematoma of the duodenum.<sup>16</sup> The first report of this condition in the American literature, made by Oppenheimer, in 1933, concerned a patient with carcinoma of the pancreas with infiltration of the duodenum.<sup>15</sup> A review of the literature reveals 23 cases of duodenal hematoma. Seventeen were associated with blunt abdominal trauma;<sup>4, 11, 20, 21, 23</sup> three cases were believed to be spontaneous;<sup>6, 7</sup> one instance was associated with carcinoma of the pancreas;<sup>15</sup> one case was related to pancreatitis;<sup>13</sup> and one was associated with a bleeding diathesis in an infant.<sup>10</sup> Two cases of duodenal hematoma secondary to anticoagulant therapy have recently been added.<sup>24</sup>

A review of the case records at the Kings County Hospital Center for the past ten years (1950-1960) revealed no cases of hematoma of the duodenum. In recent months, however, two cases have been seen on the Surgical Service.

## Case Reports

**Case 1.** A. L. (Kings County Hospital 43891), a 69-year-old white man, was admitted on 9-27-61 with a four-day history of crampy periumbilical pain which radiated to the right lower quadrant. There had been nausea, vomiting and anorexia but no hematemesis, melena, or alteration in bowel habits. Patient denied any history of trauma and had not received anticoagulants.

Physical examination revealed a well developed, poorly nourished man who was afebrile with normal vital signs. There was increased antero-posterior diameter of the chest with hyperresonance and diminished breath sounds; the heart was regular with a rate of 85/min. The abdomen was flat with right lower quadrant tenderness and rebound tenderness. There was dullness in the right lower quadrant and bowel sounds were hypoactive. Guaiac test for blood in the stool was negative. There were no external signs of trauma or ecchymoses of the skin. The hemoglobin was 10.0 Gm., the white blood cell count, 29,600. The BUN was 69 mg.%; serum electrolytes, and liver profile were within normal limits. Prothrombin-time, Lee-White Clotting Time, Dukes Bleeding Time, Rumple-Leeds capillary fragility test, and peripheral smear for platelets were normal. X-ray films of the abdomen taken on admission revealed a mass in the right upper quadrant and obliteration of the right psoas shadow (Fig. 1).

An emergency exploratory laparotomy was performed through a right paramedian incision. The peritoneal cavity was free of blood or ascites. There was an ovoid mass, 10 × 8.0 cm., involving the antero-lateral wall of the second and third

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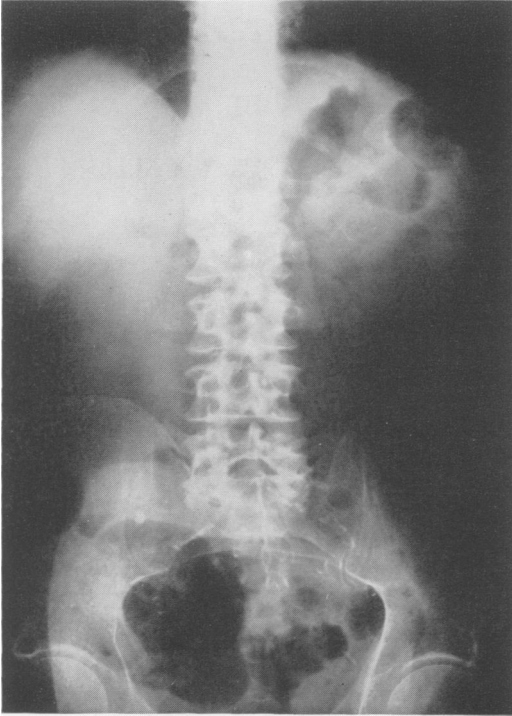


FIG. 1. (Case 1) X-ray of abdomen taken on admission revealed a mass density in the right upper quadrant with depression of the hepatic flexure and obliteration of right psoas shadow.

portions of the duodenum. The mass was tense, dark blue and looked like a hematoma which was narrowing and occluding the lumen of the bowel. The mass was incised and approximately 100 cc. of old dark blood and clots were evacuated from the subserosal area. A small artery protruding from the surrounding muscle, actively bleeding, was ligated. This was a branch of the pancreaticoduodenal artery and was thought to be the source of the hematoma. No other evidence of bleeding was found and exploration of the abdominal viscera revealed no other abnormality.

Postoperatively, the patient required a tracheostomy for pulmonary drainage but otherwise did well. An upper gastro-intestinal series performed 16 days postoperatively revealed a residual extra-luminal defect in the descending duodenum (Fig. 2). The patient had no further gastro-intestinal complaints, he gained weight and he was discharged on a regular diet. No cause for initial emaciation was discovered.

**Case 2.** J. J. (Kings County Hospital 28323), a 40-year-old Negro man, was admitted on 6-24-61. Patient had been in good health until

three days prior to admission, when he had sudden intermittent abdominal pain, increased by foods or fluids and accompanied by vomiting. On admission, the patient had a temperature of 37.7° C., blood pressure 88/60 and pulse 110/min. There were scattered rhonchi and occasional dry rales and wheezes throughout both lungs. The heart was regular with a rate of 110/min. The abdomen was round with bulging in the flanks; there were left upper quadrant guarding and tenderness; no rebound tenderness or rigidity. Bowel sounds were hypoactive. The rectal examination was not remarkable. There was a normal hemogram. Aside from 3+ glycosuria, urinalysis was not remarkable. The BUN 53 mg.%, glucose 303 mg.%, CO<sub>2</sub> 40 mEq./L., Cl 54 mEq./L., serum amylase 500 (Somogyi) units, repeat serum amylase 756 units. X-ray films revealed proximal small bowel obstruction with massively distended stomach (Fig. 3). A diagnosis of acute pancreatitis was made and the patient was treated with Levin tube suction, intravenous fluids, tetracycline and probanthine. Vital signs were stabilized with fluid replacement. The serum electrolytes were corrected to normal values. The serum amylase in-

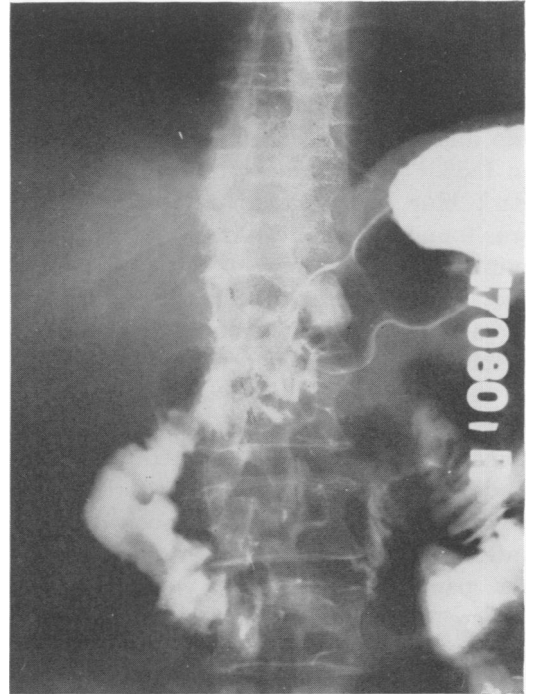


FIG. 2. (Case 1) Gastro-intestinal series 16 days postoperative revealed residua of extra luminal defect in descending duodenum but no obstruction to free flow contrast media through duodenum.

creased to 756 and then dropped to 114. The patient continued to run a febrile course. A gastro-intestinal x-ray series, done six days later, revealed an extrinsic mass compressing the second portion of the duodenum (Fig. 4). On 7-3-61 while awaiting operation, patient vomited, temperature rose to 38.8° C. and the serum amylase rose from normal level to 325 units. He expired 12 hours later.

At autopsy examination, the peritoneal surfaces were smooth, without fluid in the peritoneal cavity. The parietal peritoneum around the cecum, the serosal surface of the stomach along the greater curvature, and some areas around the pancreas appeared red and infiltrated with fresh blood. There were hemorrhagic patches on the anterior aspect of the pancreas facing the lesser sac. On section of the pancreas other hemorrhagic areas were seen scattered throughout, as well as a few calcific nodules. The head of the pancreas contained a small cavity filled with greyish turbid material. The over-all consistency of the organ seemed increased, particularly around the head. The distal portions of the ducts of Santorini and Wirsung were patent, whereas the proximal por-

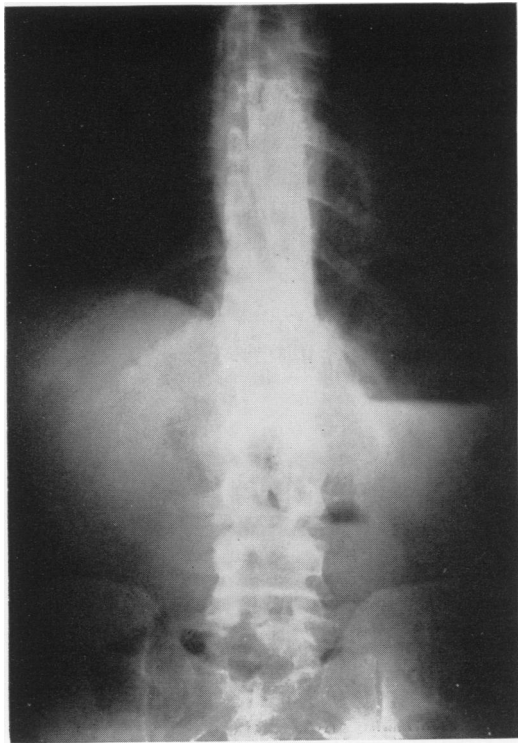


FIG. 3. (Case 2) X-ray of abdomen taken on admission revealed a pyloric or proximal small bowel obstruction with massively distended stomach.

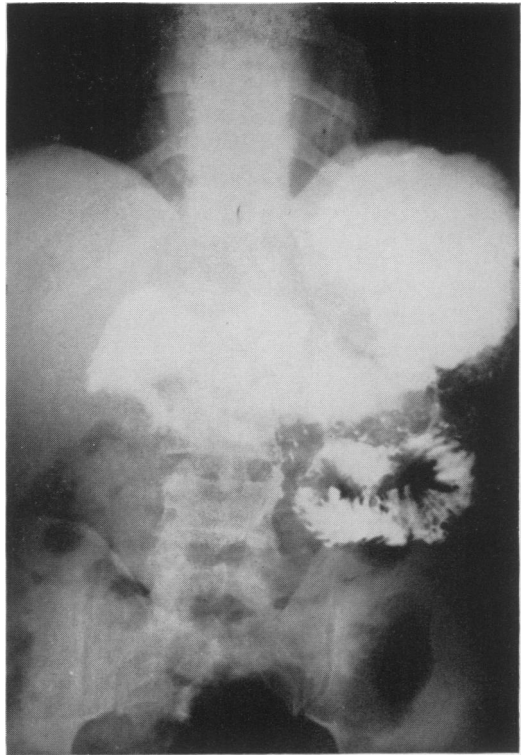


FIG. 4. (Case 2) Gastro-intestinal series 5 days after admission revealed marked extrinsic pressure deformity of entire duodenal sweep with compression and effacement of normal mucosal pattern. Compressed mucosa appears to be intact and non rigid.

tions of the ducts were not identified. The stomach was distended with air. The lower portion of duodenum was infiltrated with blood which appeared to be contained between the serosal and mucosal layers of the duodenum (Fig. 5). The hematoma was tense and bluish in color, measured 8 × 4 × 4 cm., and partially occluded the lumen of the duodenum (Fig. 6). The remainder of the gastro-intestinal tract was normal.

### Discussion

Intramural hematoma of the duodenum usually follows trauma of the abdomen, but may occur without trauma or in patients with increased bleeding tendencies. Case 1 is unusual as there was no history of trauma or bleeding tendency, and a small branch of the pancreatico-duodenal artery was actively bleeding.

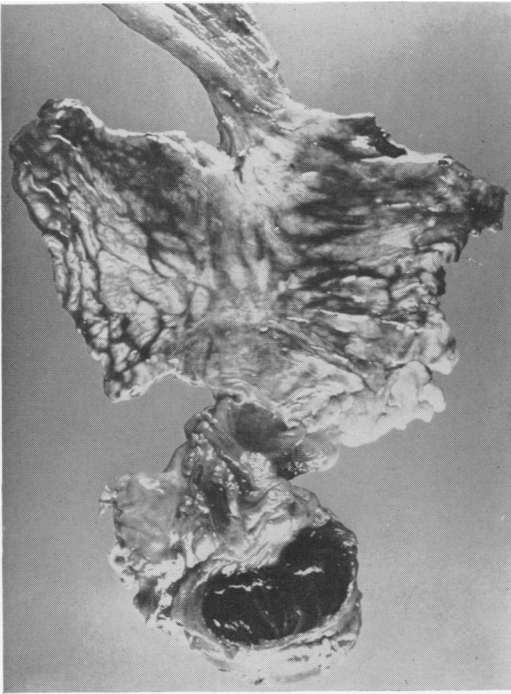


FIG. 5. The stomach is opened along the greater curvature. The lower portion of the duodenum is seen infiltrated with blood which appears to be contained between the serosal and mucosal layer of the duodenum.

Case 2 was also unusual as there were signs and symptoms of acute pancreatitis, as in a case described by McCellan.<sup>13</sup> He suggested that the etiology of duodenal hematoma there was secondary to pancreatitis, a view which we question as duodenal hematoma may be primary and the pancreatitis due to obstruction and increased pressure in the pancreatic duct system. The proximal pancreatic ducts could not be identified and were compressed in Case 2, whereas the distal ducts were dilated.

Complicating hemorrhage may occur in two to three percent of patients receiving anticoagulants. One would expect an increase in the number of these hemorrhagic complications, and of intramural hematomas of the small bowel.

Though intramural hematoma may occur in any part of the small bowel, the duodenum appears to be the site of predilection

for hematomas which are traumatic, spontaneous or secondary to blood dyscrasias. The location of the duodenum, with fixation, may make it very susceptible to trauma compressing it against the vertebral bodies. Its extensive vascularity may be significant also.

The literature and our own cases reveal that presenting complaints are usually intermittent abdominal pain with nausea and vomiting. The history, usually of two to four days duration, may include blunt abdominal trauma within 48 hours prior to the onset of symptoms. The physical findings are confined to the abdomen with right upper quadrant tenderness and guarding. There may be a suggestion of a right upper quadrant mass. Bowel sounds are hypoactive. The findings often suggest high small bowel obstruction. Unless there are other reasons for a pyrexia, the patient is generally afebrile and has a leukocytosis. The coagulation tests in our cases were normal. When extravasation of blood into the duodenal wall is due to bleeding tendencies, the prothrombin time is markedly elevated.<sup>1, 18, 24</sup>

Survey x-ray films of the abdomen may reveal findings suggestive of duodenal hematoma described by Felson and Leven:<sup>7</sup> distended loops of small bowel in the left upper quadrant, an ill-defined mass in the right upper quadrant, and obliteration of the right psoas shadow. The findings on gastro-intestinal x-ray series are almost diagnostic when all the following manifestations are present: Classically, the lesion involves the descending and transverse segments of the duodenum, but occasionally involves the bulb or upper jejunum. The proximal portion of the abnormal segment shows only thickening of the mucosal folds. More distally, an intramural mass is present, associated with widening of the lumen and a "coil spring" appearance caused by crowding of the valvulae conniventes. Partial obstruction is common. Extrinsic pressure upon the greater curvature of the

stomach and widening of the duodenal loop are seen, and are probably attributable to extraduodenal extension of the hematoma.

The surgeon confronted with these signs and symptoms must consider this diagnosis. If the patient is taking anticoagulants or has a bleeding tendency these symptoms are more significant.

Though it has been stated that surgical intervention may be avoided in the absence of complete obstruction, it appears that laparotomy is the treatment of choice either by evacuation of the hematoma or gastro-enterostomy. Drainage of the hematoma should be avoided as in-folding of the wall may occur at the site of the penrose drain, causing intestinal obstruction. When duodenal hematoma is suspected and prothrombin time is elevated, conservative management is indicated, with Vitamin K intravenously, intestinal intubation, and watchful waiting.<sup>1, 24</sup>

In Case 1, laparotomy and evacuation of the hematoma relieved the symptoms. In Case 2 failure to perform a timely laparotomy may have been responsible for obstruction of the pancreatic ducts and exacerbation of the pancreatitis, which ultimately proved fatal.

### Summary

Intramural hematoma of the duodenum usually follows trauma to the abdomen, but may occur spontaneously in normal patients and in patients on dicumarol therapy or with increased bleeding tendencies. In this mechanized age when increasing numbers of people are subjected to blunt trauma and increasing numbers of patients are receiving anticoagulants, the incidence of this condition will probably increase.

The clinical syndrome of intermittent periumbilical pain associated with nausea and vomiting, occurring in a patient with right upper quadrant tenderness and guarding, coupled with roentgenological findings of obliteration of the right psoas shadow,

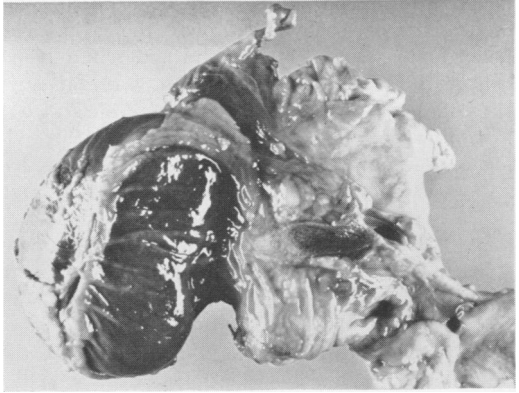


FIG. 6. A closer view of the hematoma, which was tense, blue in color and measured  $8.0 \times 4.0 \times 4.0$  cm. The lumen of the duodenum was partly occluded by this mass.

is reviewed here in order to direct the attention of the clinician to the possibility of this diagnosis.

Laparotomy and surgical evacuation of the hematoma appear to be the treatment of choice. When this condition develops during anticoagulant therapy with excessive hypoprothrombinemia, early recognition, restoration of prothrombin activity to safe levels, and conservative management of the obstruction are reported to suffice.

### Addendum

Since the paper was submitted for publication another case of intramural hematoma of the duodenum was seen on the Surgical Service of the Kings County Hospital. On the basis of our previous experience with intramural hematoma the correct diagnosis was made pre-operatively.

**Case 3.** R. R. (KCH 16539). This 11-year-old boy was admitted on 4/11/61 with a history of having been struck in the left upper abdomen 72 hours prior to admission. Anorexia was noted approximately 60 hours prior to admission and generalized abdominal pain was present for the 48 hours prior to admission. There had been vomiting for the 24 hours immediately prior to admission.

Physical examination revealed a well developed, well nourished male with a temperature of  $37.7^{\circ}$  C. and normal vital signs. The abdomen was flat with diffuse tenderness, and rebound tenderness. Bowel sounds were absent. Rectal examination was not remarkable and stool was

negative for blood. There were no external signs of trauma or ecchymoses over the skin. The hemoglobin was 12.2 Gm. and the white blood cell count was 12,950. Aside from a serum amylase of 1014 Somogyi units, serum electrolytes, urea nitrogen, blood sugar, liver profile and bleeding determinations were within normal limits. X-ray examination of abdomen revealed a large stomach containing moderate amounts of gas and fluid. There was no gas in small bowel. There was gas and feces in large bowel. The hepatic flexure appeared to be depressed by a right upper gradient mass.

A diagnosis of intramural hematoma of the duodenum with secondary pancreatitis was made. At laparotomy there was 250 cc. of serous fluid in the peritoneal cavity. An ovoid mass  $8.0 \times 7.0$  cm. in diameter involving the anterolateral wall of second and third portions of the duodenum was found. The mass was incised and 150 cc. of old dark blood and clot were evacuated from the subserosal area. Postoperatively the patient has done well without signs of intestinal obstruction or pancreatitis.

This case presented the rather typical signs and symptoms of intramural hematoma of the duodenum with classical radiological finding. Laparotomy and drainage of hematoma provided adequate treatment of the entity.

### Acknowledgment

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