

CARCINOMA IN THE DUODENUM

ORIGINATING FROM ABERRANT PANCREATIC CELLS

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CARCINOMA occurring in the duodenum is an unusual condition.

Carcinoma found in the duodenum proven to have originated from misplaced pancreatic cells is very rare, a fairly careful search of the literature having revealed but one somewhat similar case in which the site of the new growth was at the pylorus and involving the stomach wall as well as the duodenum.

The first case of duodenal malignancy was reported by Hamburger, in 1746. His case had a carcinoma situated in the first portion which perforated; a fatal peritonitis followed. Jefferson collected reports of 109,201 autopsies from English, German, American and Swiss hospitals and found only forty-three cases of carcinoma of the duodenum or about .04 per cent. A statement of interest and fact is made by this author to the effect that "inch for inch the duodenum is more likely to undergo carcinomatous change than the jejunum or ileum," so that, rare as a malignant neoplasm is in the proximal end of the small bowel, it is still more rare in its distal portion.

Most of the cases of carcinoma of the duodenum reported seemingly spring from the cells of the lining mucosa and fewer from Brunner's glands; many of these cases having the history of a long-standing ulcer with ensuing malignant degeneration. The possibility of aberrant pancreatic cells being a point of origin is hinted at by many authors, but proof as to its actual occurrence is usually lacking. Bland-Sutton rather belittles this idea when he states "a consideration of tumors of the small intestine would be incomplete without reference to the suggestion that cancer of the small intestine may arise in an accessory pancreas—it is necessary to mention accessory pancreas when considering cancer of the duodenum and small intestine because those pathologists who still believe that carcinoma arises in embryonic vestiges think it probable that this perversion may arise in islands of pancreatic tissue. There is no evidence to support this theory nor that which attributes duodenal cancer to morbid changes in Brunner's glands." The actual incidence of a malignant change taking place in a duodenal ulcer is a point that is still *sub judice*.

Ewing classifies carcinoma of the duodenum as follows:

(1) Carcinoma following ulcer; similar to pyloric ulcero-carcinoma which leads to stenosis and adhesions and in which class metastases are frequent and widespread.

(2) Carcinoma found about the papilla of Vater; in which group jaundice

occurs early and fairly constantly—in twenty-three out of twenty-five cases quoted by Mathieu. These carcinomata are usually derived from the intestinal mucosa.

(3) Carcinoma of the third portion; or pre-jejunal carcinomata; usually associated with ulceration and stenosis.

An origin from Brunner's glands has been suggested by Orth and from aberrant pancreatic tissue by several writers. Many of the cases are difficult to separate from primary carcinoma of the pancreas.

Outerbridge states that theoretically at least six points of possible origin must be considered in carcinoma in the region of the papilla of Vater:

- (1) From epithelial cells lining the true ampulla.
- (2) From cells lining the common duct at its lower end.
- (3) From cells lining the pancreatic duct at its lower end.
- (4) From the duodenal mucosa covering the papilla.
- (5) From the glands of Brunner situated beneath the duodenal mucosa.
- (6) From aberrant pancreatic acini in the wall of the common duct.

Embryology.—The formation of the pancreas is well advanced in the second month of fetal life. It springs from a hollow projection from the dorsal wall of that portion of the foregut which afterward becomes the duodenum opposite the hepatic diverticula which springs from its ventral wall. The hollow process grows between the two layers of the dorsal mesentery and by sending out offshoots which branch abundantly, eventually forms the pancreas. As torsion of the stomach takes place, the pancreas assumes a transverse position and becomes fixed across the dorsal wall of the abdomen, the posterior layer of its mesentery undergoing absorption.

From this it may be seen that in its formation some of the cells of the pancreas may have been dislocated or misplaced during fetal life and may and often do result in the formation of an accessory pancreas or aberrant pancreatic rests in or about the region of the duodenum. In our case, there must have been a plaque of pancreatic tissue under the mucosa of the duodenum separate and distinct from the pancreas proper, as it was noted at operation that the duodenum at the site of the tumor was very easily mobilized and brought up into the wound for satisfactory examination. The duodenum at this point had somewhat of a mesentery which might have been factored by traction on the bowel and the mobile peritoneum above and below followed it. Fact is emphasized to show definitely that there was no connection between the tumor found in our case and the pancreas proper.

CASE.—Mrs. A. F., aged twenty-eight, married, was admitted to Lebanon Hospital September 17, 1930, complaining of: (1) pain in the epigastrium; (2) pain in lumbosacral region radiating down left thigh.

The patient was operated on in Germany at the age of nineteen for appendicitis. Had pneumonia in 1920, 1921 and 1922. During 1927 was in a hospital in Germany and treated for ulcer of the stomach. For the past three years she has complained of pain in the upper part of the abdomen. This pain appears about two to three hours before meals and lasts until about one hour after the meal. This pain is described as drawing in character and radiates all over the abdomen. She has not complained

of sour eructations or vomiting. Never noticed that her stools were dark. Has been afraid to eat meat because she claims that this aggravates the pain. Appetite fair. Bowels occasionally constipated and diarrhoea rarely. No urinary symptoms. Menses regular. Married nine months. Perspires very freely at night. Has lost ten pounds in the last four weeks. Feels weak and is easily fatigued. The pain in the lumbosacral region has been annoying her for the past two weeks and has been increasing in severity. This pain is across her back and seems to radiate down her left thigh.

The patient does not look acutely ill. No cervical or axillary adenopathy.

Palpation of the abdomen reveals no masses. There is a sense of resistance, half of the abdomen more marked on the right side than the left. Radioscopic examination of the pelvis discloses arthritic changes involving both sacro-iliac synchondroses with slight broadening of the right.

Fluoroscopic examination shows the stomach to be "J" shaped, normal in contour and moderately ptosed. Duodenal bulb is incompletely filled. The first portion of the basal region of the cap shows a circumscribed clear shadow due to displacement of some barium. A re-examination shows this same filling defect. Six hour film showed no gastric residue. Head of opaque meal at the hepatic flexure, tail in terminal ileum. There are a few flakes of barium in the first portion of the duodenum. Films taken at these examinations reveal the same findings as the fluoroscopy.

Conclusions.—Combined radioscopic and fluoroscopic examination of the upper gastro-intestinal tract disclose the presence of an organic lesion in the first portion of the duodenum the characteristics of which suggest that the lesion is probably a benign tumor, such as a polyp. Gastric extraction, free HCl, 0; total HCl, 17.

Urine, blood, sputum and examinations negative.

Operation September 30, 1930. Gas-oxygen-ether anaesthesia. Upper right rectus incision. No free fluid found on opening the peritoneal cavity. In the first portion of the duodenum and within the first inch of this structure there is a small mass palpable within the wall of the bowel. This is circular in outline and about one and a quarter centimetres in diameter. Seems to be firmly attached to the duodenal wall at its antero-inferior aspect. Just below this structure there is some puckering of the peritoneum on the duodenal wall which extends downward toward the pancreas. The duodenum can be lifted well away from the pancreas and an artificial mesentery created by traction; this artificial structure contains no glands and is very thin.

In order to examine the tumor more thoroughly an incision was made in the normal duodenal wall and lengthened so as to include the pylorus and some of the stomach wall. The tumor was now turned out through this incision and found to be a smooth, disc-like structure about a half centimetre in thickness. It was covered with mucous membrane which was not ulcerated. The mass itself was firmly embedded in the duodenal wall and was practically immobile. The mass seemed hard and did not fluctuate. The tumor was excised by a circular incision well away from its margins. During this procedure the mass, which was a cyst, ruptured. The walls of the cyst were about one quarter centimetre in thickness and it had a smooth-lined cavity. The fluid which escaped into the protecting laparotomy pads was light brown in color and contained some brown, dustlike particles.

The rent made by the excision of the tumor was closed, as was the incision made in the bowel to inspect the tumor. The duodenum, as the result of this suturing, seemed somewhat narrowed, so a gastrojejunostomy was made. No glands were palpated at any time. Abdomen closed.

Microscopic section of the material removed shows mucosa infiltrated with numerous red blood-cells which have formed a rather thick layer on the surface and extend down between the glandular elements to the submucosa. The muscularis is normal but in the outer coat of the latter are numerous discrete and confluent islands composed of simple acini bound together with small strands of connective tissue. These islands or nests resemble the normal pancreatic tissue but there are no islands of

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Langerhans. In some areas there is breaking through of the muscle fibres and the cells of the acini mentioned are growing in a wild disordered manner. The serosa is infiltrated and covered with blood.

Diagnosis.—Carcinoma of the duodenum; probably secondary to pancreatic rest.

The only other case that approaches the pathologic aspects of this case is the one reported by Branham. This case is cited by Deaver and Ravdin as having been published in 1913, Jefferson giving the date as 1903. It appeared, however, in the Maryland Medical Journal in 1908. Branham's case is one of a growth at the pylorus involving the stomach wall as well as the first portion of the duodenum. A pylorotomy was performed. The sections were seen and attested to by Welch as originating from pancreatic tissue. Patient was reported well and free from symptoms nine years later.

A point of great diagnostic significance is gleaned from many reported histories of cases of carcinoma of the duodenum, *i.e.*, the stomach analysis in a very large number shows a very low acidity or complete absence of free hydrochloric acid; this obtained in our case. The importance of this sign is that, given a case which clinically may be considered one of ulcer, and the gastric analysis shows a lowered or totally deficient acid content, the diagnosis of a carcinoma must be well considered and a good X-ray examination made to complete the picture for diagnosis previous to a radical restriction of the ulcer.

In this case a malignancy was not suspected and it was not until the pathologic report was returned that the true nature of the condition was disclosed. A sub-total resection of the duodenum and adjacent stomach might have been made at the time had the real state of affairs been known, or suspected but the patient left the hospital and only consented to remain under observation by her family physician, who has reported a marked gain in weight and strength.

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