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The Roentgen Diagnosis of Early Enlargement of the Head of the Pancreas

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THE roentgenologic exploration of the pancreas by direct methods has been impossible up to the present time. The roentgen diagnosis of pancreatic disease has been very unsatisfactory and unreliable in many instances. A diagnosis of pancreatic disease is possible only in late instances where an enlargement of the head of the pancreas produces signs of pressure on the adjacent organs. Owing to the anatomic position of the pancreas, its relation to the concave aspect of the duodenum and greater curvature of the prepylorus, pressure defects may be observed in cases with neoplasm or inflammatory process involving the head of the pancreas. Since the majority of lesions of the pancreas usually involve the head, a meticulous mucosal roentgenologic examination should be made with compression in order to recognize the early changes in the ampullary portion of the descending duodenum. Little attention has been directed to the mucosal configuration and contour of the periampullary portion of the duodenum. More recently we made a painstaking study of a small series of cases, paying particular attention to the mucosal configuration of this segment of the duodenum. We have encountered two cases revealing typical roentgen signs, showing evidence of a filling defect, shaped like an inverted three, in the ampullary portion of the duodenum. This defect represented evidence of pressure of the head of the pancreas. The roentgenograms showed two small depressions, of smooth contour, well defined, with a small projection between the depressions which formed the inverted figure three. The configuration of Kirkrings folds is distorted and displaced and the surrounding mucosa show evidence of pressure.

Heretofore the roentgenologist's technic and experience did not permit an early diagnosis of lesions in the second portion of the duodenum until marked changes were demonstrable. However, slight changes in the direction, shape and contour of the mucosal markings now offer a means of early diagnosis of disease of the head of the pancreas which have previously evaded our attention. The roentgenologist need not wait for the marked distention, displacements, pressure defects and stenosis, to make a diagnosis of a lesion of the head of the pancreas. These are late signs which do not offer any difficulty in diagnosis. Examination of the ampullary portion of the duodenum with special attention to the changes in contour, and changes in mucosal markings will often yield findings of inestimable diagnostic import.

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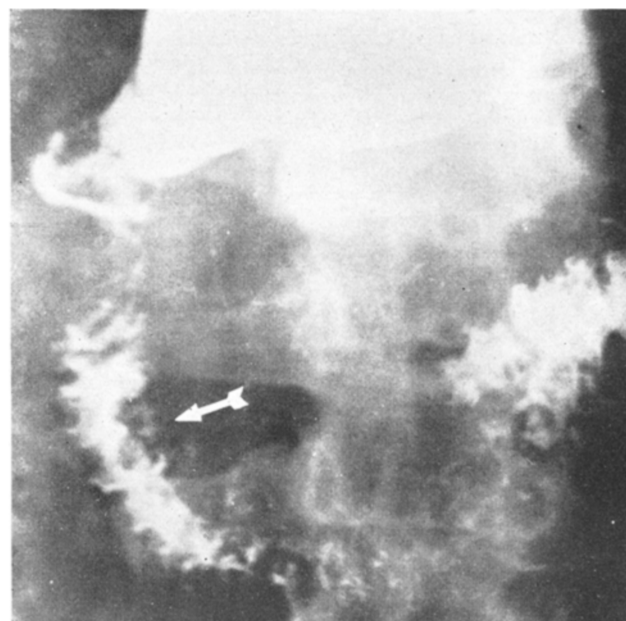
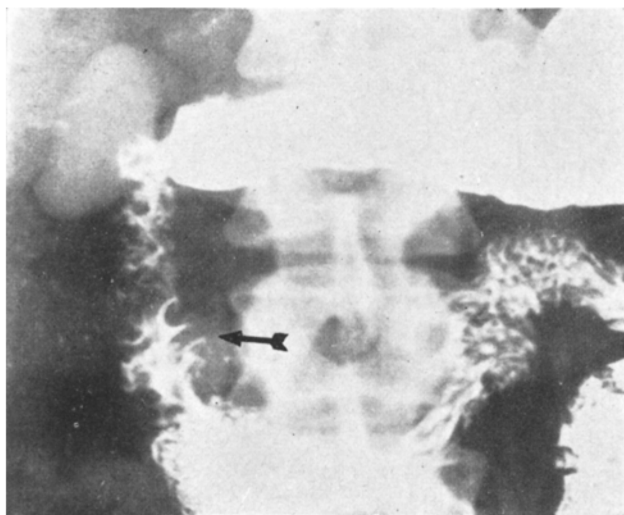
Frostberg recently reported three instances in which he demonstrated a typical roentgen picture in the form of an inverted three, which was produced by pressure, due to a slight enlargement of the head of the pancreas. His observations were confirmed by autopsy studies.



Case 1, Fig. 1. The inverted three filling defect is shown at arrow. Note the compression of the mucosal folds. The two small depressions and the small protrusion between them is demonstrated.

A brief report of our two cases with roentgenographic illustrations of the characteristic inverted three deformity is shown in Figs. 1 and 2.

Case 1, male, aged 54, obese, complained of epigastric pains of six months duration, loss of weight, abdominal distention, belching and constipation. A gastro-intestinal



Case 2, Fig. 2. The sharply outlined inverted three pressure defect is shown at arrow. The two small depressions and the protrusion between them is well illustrated. The depressions represent slight pressure of the head of the pancreas. The protrusion the papilla.

X-ray revealed a prepyloric narrowing with mucosal changes suggestive of a gastritis; an inverted three pressure defect on the concave aspect in the ampullary region of the descending duodenum; irritable colon (mucous colitis stringing). A gall bladder visualization test revealed a normal functioning gall bladder, without stones.

Case 2, male, aged 57, complained of vague digestive disturbances, gas, distention, bloating of abdomen, no pain. Examination of stools revealed evidence of a pancreatic disturbance, and also occult blood. A gastro-intestinal X-ray examination showed a rapidly emptying stomach, with a deformity of the duodenal cap due to an ulceration; the descending portion of the duodenum in the ampullary segment showed an inverted three filling defect due to slight pressure as result of enlargement of the head of the pancreas. The remaining small intestine was normal; colon was markedly irritable. A gall bladder visualization test revealed a normal functioning gall bladder without stones.

SUMMARY

The roentgenologic diagnosis of early changes in the head of the pancreas is presented with a report of two cases. Roentgenologic changes in the mucosal configuration and contour of the ampullary portion of the duodenum now offer a newer field in the diagnosis of intrinsic and extrinsic pathology affecting this segment of the intestine. Since the majority of lesions of the pancreas involve the head, its close relationship with the ampullary portion of the duodenum is more likely to reveal some abnormality of the duodenum. If more attention is focused upon this area the roentgenologic examination should yield changes leading to a correct diagnosis in many instances. It is now possible to demonstrate the finer details in the configuration of Kirkrings folds by the compression method. Minute changes in the mucosal pattern in the ampullary portion of the duodenum have hitherto escaped our attention. The new roentgen sign illustrated by an inverted three defect in the descending duodenum is produced by pressure of the head of the pancreas. The mucosal markings are displaced but not effaced by this pressure. The roentgen sign described as being due to disease of the head of the pancreas, though indicative of pressure does not in itself determine the etiologic factor, as any pathologic process involving the head may produce a similar picture. However the roentgen demonstration of pressure due to slight enlargement of the head of the pancreas aids in localizing the lesion and with further corroboration of the clinical and other laboratory data is of inestimable value in the diagnosis of early pancreatic affections.

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A Roentgenologic Consideration of Colopathies Associated With Gall Bladder Disease

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THE opinion that irritable and other conditions of the colon are frequently associated with gall bladder disease, has been voiced by many authorities. However, there is no unanimity of opinion that gall bladder disease and irritable states of the gastro-intestinal tract always coexists. There seems to be a dearth of statistical information regarding this subject. In a survey of the literature there appears to be numerous statements regarding the association of gall bladder disease and irritable conditions of the gastro-intestinal tract, but as far as I can ascertain from the available literature, no large series of cases have been seen studied previously to show the comparative difference between the number of colopathies found in the normal and those found in the pathological gall bladder groups. Since some attention has been focused upon this subject, and since increasing importance has been attached to the effect of irritable states of the colon in its relation to gall bladder disease, the necessity for a detailed statistical study offers a factual basis for an opinion regarding the association of these conditions. This communication is therefore concerned with a statistical study in order to correlate the coexistence of the various colopathies in cases of normal and pathological gall bladders observed in the routine roentgenologic examinations.

A survey was made of 230 consecutive cases, on whom a gall bladder visualization test and a gastro-intestinal or colon enema examination had been made,

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