

# Whipple pancreaticoduodenectomy: a historical comment

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## Abstract

Allen Oldfather Whipple is a name that will be forever eponymously associated with pancreaticoduodenectomy for pancreatic cancer. This paper presents the history behind this procedure.

## Keywords

Pancreaticoduodenectomy; Whipple; history.

## Case report

Allen Oldfather Whipple is a name that will be forever eponymously associated with pancreaticoduodenectomy for pancreatic cancer. The state of pancreatic surgery when Whipple published his first series of the two-stage procedure in 1935, was as Whipple was to comment in his unpublished memoirs, "...a more or less unexplored field"<sup>[1]</sup>. Prior to this, pancreatic resection was mainly confined to local resection or extended ampullectomy of tumours of the ampulla of Vater. History was to record only four successful resections by Halsted, Kausch, Hirschel and Tenani<sup>[2]</sup>.

Whipple initially published a series of two-stage radical pancreaticoduodenectomy in 1935<sup>[3]</sup>. He reported three cases, with one perioperative death, one patient dying at 8 months from cholangitis and the third patient surviving 28 months eventually dying of liver metastases. The development of a one-stage procedure up until this point was practically impossible, due to the bleeding diathesis invariably associated with the accompanying obstructive jaundice. Although vitamin K was discovered in 1929, it only became commercially available in 1939.

"Pancreaticoduodenectomy for islet carcinoma - a five year follow-up" was the title of a presentation by Dr Allen O. Whipple to the New York Surgical Society and Philadelphia Academy of Surgery at the NY Academy of Medicine, February 14, 1945—a paper that was to change the future of pancreatic surgery<sup>[4]</sup>. In this paper Whipple describes the first reported case of a one-stage pancreaticoduodenectomy for a carcinoma of the head of the pancreas, which interestingly was reported as a tumour of the islet cells rather than the acinar tissue. The patient, a 53-year-old female was diagnosed preoperatively as having a carcinoma of the antrum of the stomach. However, only after the stomach was divided (without opening the lesser sac, which Whipple himself was to admit was a mistake) was it discovered that the preoperative diagnosis was incorrect and in fact there was a tumour in the head of the pancreas. As a result, a distal

gastrectomy was converted to a one-stage pancreaticoduodenectomy, made possible by the absence of jaundice. Gastro-enteric continuity was re-established by an antecolic gastrojejunostomy, with the biliary enteric continuity re-established by an end to side choledochojejunostomy. It was quite common at the time to use the gallbladder as a means of decompressing the biliary tree or re-establishing biliary enteric continuity, however in this case the gallbladder was removed as it could not be used for an anastomosis. This was probably fortunate, as history had already recorded that these patients invariably developed recurring cholangitis of which many patients died. It is also interesting to note that Whipple's management of the remnant pancreas was to simply tie off the pancreatic duct and not perform a pancreatico-enteric anastomosis. This had previously been successfully performed by Kausch<sup>[2]</sup> and was indeed one of Whipple's recommendations at the end of his paper. Interestingly, this patient did not suffer any endocrine insufficiency as a result of the pancreatic duct occlusion and indeed at follow up fasting blood glucose was normal.

As a result of this operation Whipple was to recommend a one stage procedure as well as condemning the two stage procedure for the following reasons. With the advent of vitamin K, haemorrhage could be controlled; it avoided two anaesthetics; avoided troublesome adhesions as a result of the first operation; implanting the common bile duct into the jejunum avoided the dangers of cholecystoenterostomy and biliary fistula and the pancreatic duct should be re-implanted into the jejunum. Whipple had already performed a further 19 one stage procedures with a mortality rate of 31%.

Current practice does not differ significantly from that described by Whipple<sup>[5]</sup>. However, most surgeons now perform a pylorus preserving pancreaticoduodenectomy as described by Traverso and Longmire<sup>[6]</sup>, rather than include the distal stomach in the specimen. Biliary enteric continuity is re-established by a choledochojejunostomy and pancreatic enteric continuity is re-established either by a pancreaticogastrostomy or pancreaticojejunostomy. Currently, pancreaticoduodenectomy should be performed in specialist centres where mortality rates can be in the region of 5% or less with 5 year survival rates approaching 40% for node negative and margin free disease<sup>[7]</sup>.

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