Adenomatous and Hyperplastic Nodules Develop Separately after Long-Term Pancreatico-Biliary Diversion (PBD) in Rats

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In the rat, diversion of bile and pancreatic secretions (PBD) to the ileum is associated with the development of pancreatic hyperplasia within one week [Miazza et al, Gut 1980;21:A917]. Long-term (> 21 months) PBD results in both hyperplastic and adenomatous nodules [Stace et al, Gut 1987;28:21, 265]. Whilst it is generally accepted that hypercholecystokinaemia is responsible for the pancreatic hyperplasia, the chronological sequence of nodule development has not been studied. We wished to see if the hyperplastic nodules progressed to adenomas and ultimately carcinomas.

Methods: Materials and techniques were as previously described [Miazza et al, in Mechanisms of Intestinal Adaptation, MTP Press, 1982, 481-490]. Following PBD or intestinal transection (controls), the rats were housed under conventional conditions for at least 15 months prior to the pancreatic studies.

Results: With one exception, all animals gained weight; there was no significant difference between body weight gain in the control and PBD groups. At 15 months, all 6 PBD animals studied had developed hyperplastic nodules but in only 3 were adenomatous nodules also present (table).

Time in Hyperplastic Adenomatous Ratio
months nodules (H) nodules (A) H/A

15	6	34	5	6.8
18	5	52	18	2.9
21	5	40	18	2.2
24	5	63	25	2.5

At 18 months, all the PBD rats studied had both hyperplastic and adenomatous nodules and the ratio H/A fell to 2.9. In only 8 instances were 'mixed' nodules found. No nodules were found at any time in the control rats. These results suggest that the formation of adenomatous nodules is later and separate from that of hyperplastic nodules.

Hypothesis: Hyperplastic and adenomatous nodules arise from pancreatic cells which differ in their reactivity towards cholecystokinin.