

Secretin MRCP Derived Quantification of Function in Chronic Pancreatitis

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Introduction

We have previously reported the use of Secretin MRCP to quantify pancreatic function. We have now studied a group of normal patients and patients with chronic pancreatitis.

Methods and Materials

74 patients referred with suspected or known pancreatic pathology underwent SSFSE MRCP both before and after 0.1ml/kg IV Secretin. All images were obtained on a 1.5T clinical MR system (Siemens Vision) gradient strength 22mT/m. The exact same sequence with identical positioning and receiver gain was performed prior to Secretin and at 2 minute intervals post Secretin to a mean of 7 minutes. All patients also underwent parenchymal pancreatic imaging with a coronal trufisp and axial T1W sequence. The pancreatic flow rate was calculated as the change in signal intensity over time within a ROI which encompassed not only the pancreas but the small bowel. A voxel containing 100% water was used to correct for variations in receiver gain between individuals. 63 patients had CT scans performed within 1 month of the MR study. Using the Cambridge classification patients were divided into mild, moderate and severe chronic pancreatitis.

Results

There were 31 patients who had normal pancreatic duct, normal parenchyma and normal qualitative response to Secretin. The mean flow rate in this group was 8.0 ml/min +/- 2.6. Thirty-one patients had evidence of chronic pancreatitis, 6 had mild, 6 had moderate and 19 had severe chronic pancreatitis. The mean flow rate in the mild group was 6.9 +/- 1.7, in the moderate group the mean flow rate was 6.0 +/- 1.7. Finally in the severe group the mean flow rate was 5.9 +/- 2.9. This was statistically significant from the normal group. Twelve patients had undergone surgery. Eight patients had undergone a pancreatoduodenectomy and their mean flow rate was 5.1 +/- 2.3 (p<0.05). Four patients had undergone a Puestow procedure and had variable flow rates.

Conclusion

Significantly different flow rates were found in patients with severe chronic pancreatitis compared to normals. Further there appeared to be a progressive trend down with increasing severity. Changes in flow rates in a given individual should provide useful information and a trend down on sequential measurements may prove to be an early indicator for pancreatic disease.