

## **MR Cholangiopancreatography: Does butylscopolamine (Buscopan®) make a difference to ductal visualization?**

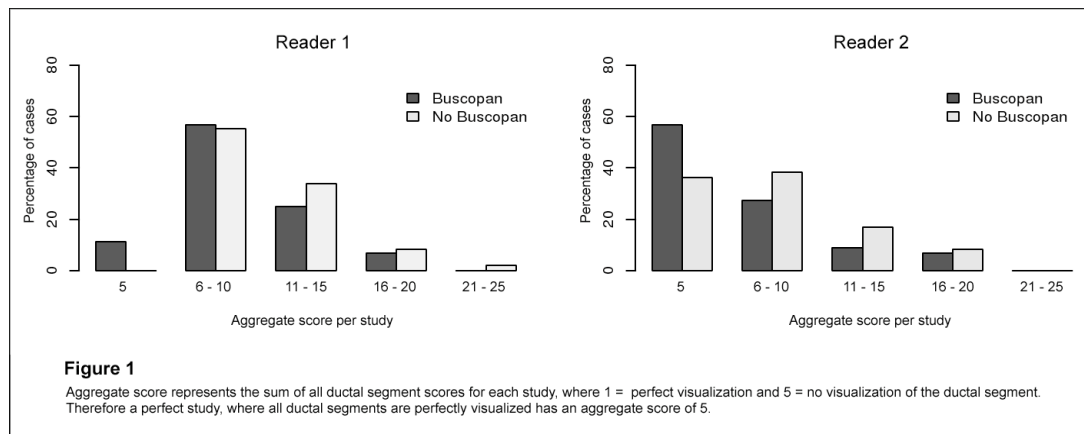
N. Yang<sup>1</sup>, S. Jenkins<sup>1</sup>, E. Colak<sup>1</sup>, and A. Kirpalani<sup>1</sup>  
<sup>1</sup>Radiology, St Michael's Hospital, Toronto, Ontario, Canada

**INTRODUCTION:** Heavily T2-weighted high-resolution 3D sequences using respiratory compensation methods have become the standard for magnetic resonance cholangiopancreatography (MRCP) examinations [1]. Due to the long acquisition time, this type of sequence is susceptible to motion artifact from surrounding bowel structures. Butylscopolamine (Buscopan® Boehringer Ingelheim GmbH) is often used as an anti-peristaltic agent to arrest bowel motion during radiologic studies and its use has been reported in MRCP studies [2][3]. Despite its use, the effect of butylscopolamine on image quality for the pancreaticobiliary system in MRCP examinations remains unvalidated.

**PURPOSE:** To evaluate the effect of butylscopolamine on the visualization of the pancreaticobiliary ductal system during MRCP.

**METHODS:** A total of 91 patients with suspected pancreaticobiliary disease referred for MRCP were reviewed retrospectively with approval from the hospital's research ethics board. 44 consecutive patients (mean age 58.9 years; range 19-89 years; 30 females and 14 males) received 30mg of IM butylscopolamine at the start of the study whilst 47 consecutive patients (mean age 52.8 years; range 20-84 years; 27 females and 20 males) did not receive butylscopolamine. Patients were scanned at 1.5 T as per our standard MRCP protocol, which includes a routine coronal 3D thin slice MRCP sequence using respiratory triggering with multiplanar maximum intensity projection (MIP) reconstructions. Two board certified, fellowship trained abdominal radiologists (E.C. and A.K.) performed a qualitative evaluation of only the source MRCP and MIP images in a blinded fashion. Cases were presented in a random order with no demographic information provided. Each reader scored separate ductal segments (inferior common bile duct (CBD), superior CBD, central hepatic, peripheral hepatic and pancreatic ducts) from 1-5 (1 = perfect visualization of the entire duct structure; 5 = ductal structure not visible). Results were subjected to statistical analysis (median visualization scores, confidence interval, interrater reliability using kappa and the Mann-Whitney U test).

**RESULTS:** Overall, there were a higher percentage of perfect ductal visualization ratings with butylscopolamine than without (Figure 1). When individual ductal segments are analysed, there is a statistically significant improved visualization of the inferior CBD with butylscopolamine ( $p < 0.05$ ) for both readers, whilst the remainder of the ductal segments demonstrated no statistically significant difference. There was substantial agreement between the two readers (mean weighted kappa = 0.64) [4].



**CONCLUSION:** Our study demonstrates improved visualization of the inferior CBD with the administration of butylscopolamine, whilst other ductal segments demonstrated no significant improvement. Thus, butylscopolamine may aid image quality when inferior CBD pathology (such as calculi or intraluminal tumour) is suspected. However, prior to the implementation of the routine administration of butylscopolamine for MRCP examinations, this small added benefit must be weighed against the potential side effects of butylscopolamine as well as the additional cost, time and interruption to work-flow.

### **REFERENCES:**

1. Asbach P, Dewey M, Klessen C, Stemmer A, Ockenga J, Huppertz A, Sander B, Hamm B and Taupitz M. Respiratory triggered MRCP applying parallel acquisition techniques. *Journal of Magnetic Resonance Imaging* 2006;24(5):1095-1100
2. Onishi H, Kim T, Hori M, Murakami T, Tatsumi M, Nakaya Y et al. MRCP at 3.0 T: Intraindividual comparative study with MRCP at 1.5T for clinical patients. *Investigative Radiology* 2009;44(9):559-56
3. Gillams A, Pereira S, Webster G and Lees W. Correlation of MRCP quantification with conventional non-invasive pancreatic exocrine function tests. *Abdominal Imaging* 2008;33:469-473.
4. Landis JR and Koch GG. The measurement of observer agreement for categorical data. *Biometrics* 1977;33:159-174.