MR-Imaging of gastric emptying induced by Erythromycin

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Introduction
Erythromycin, a macrolid antibiotic, has been found to be a gastrointestinal prokinetic agent when employed in small, non-antibiotic doses [1]. Since gastric motility disorder has been recognized as a leading cause for functional dyspepsia [2], administration of Erythromycin is one approach for therapy in patients with functional dyspepsia. The aim of this study was to assess the influence of Erythromycin on gastric emptying and subsequent small bowel filling by using MR imaging.

Methods
Six healthy volunteers with no history of gastrointestinal disorder ingested 500 ml of a high caloric, liquid nutrient, diluted with Gd-DTPA (1:50) after an eight hour fast. Gastric emptying was determined based on 3D volume measurements performed every 5 minutes up to 30 minutes in supine position following the ingestion of the nutrient with a series of coronal, T1-weighted 3D GRE (TR/TE/flip 2.0/1.0/20°) scans using a 1.5 T scanner (Sonata, Siemens). The acquisition time for each 3D data set amounted to 17sec. The examination was performed on two separate days with and without i.v. application of 50 mg Erythromycin immediately after oral ingestion of the liquid. Gastric volumes and filling of the small bowel were quantified on the 3D data sets using manual edge detection.

Results
The high caloric nutrient laced with Gd-DTPA was homogeneously bright on T1-weighted 3D data sets. Thus delineation of the gastric lumen proved easy and robust. The gastric lumen were fully covered by the 3D data sets in all twelve exams. Initial gastric volumes with and without Erythromycin failed to demonstrate a statistically significant difference (p > 0.05). After 30 minutes both groups demonstrated a significant decrease in gastric volumes (p > 0.05). The decrease in gastric volume observed in the group which had received Erythromycin was found to be significantly greater (p < 0.05, Fig 1).

Discussion
Gastric emptying is accelerated by i.v. application of Erythromycin. Hence, Erythromycin can be used to maximize the contrast passage into the small bowel for subsequent diagnostic imaging. Furthermore, it is intended to use the data determined in this study as reference values to aid in the diagnosis and post-therapeutic follow-up of patients with gastric motility disorders treated with Erythromycin.

References