to patients with low amounts of mTNF+ cells (15%). This clinical response in the former patients was sustained over a follow-up period of one year. The significant difference of the mean number of mTNF+ cells per image was 30 for anti-TNF responders and 11 for non-responders. Sensitivity, specificity and accuracy for the prediction of therapeutic responses based on a discriminative factor of 20 positive cells, were 92%, 85% and 88%, respectively. Positive and negative predictive values were 85% and 92%. Conclusions: Our data indicate a significant correlation between bone loss and prior use of anti-TNFα in a group of IBD patients expressing high levels of mTNFα in CD patients. These data indicate for the first time that molecular imaging with fluorescent antibodies in vivo has the potential to predict therapeutic responses to biological treatment and opens new avenues for personalized medicine by using fluorescent antibodies.

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Magnetization-Transfer MRI As a Non-Invasive Method of Assessing Fibrotic Intestinal Strictures in Patients With Crohn’s Disease

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Patients with Crohn’s disease (CD) develop intestinal inflammation that progresses over time to fibrotic strictures that often require surgery. Magnetization-transfer ratio (MTR) correlates with collagen content of tissue in experimental CD. We prospectively evaluated MTR in CD patients undergoing clinically indicated magnetic resonance enterography (MRE). METHODS 85 patients with history of CD who underwent MRE between August ’11 and August ’12 on a 1.5T MRI scanner (Philips Achieva NR, Philips Medical Sys, Best, NL) provided informed consent. Following administration of 1 mg glucagon iv, two breath hold T1-W GRE sequences, with and without MT respectively, were obtained. 34 patients with small intestinal disease where MT could be reliably linked to diseased small bowel were included. Measurements of MTR in the affected bowels and in paraspinal muscles was performed. Correlation was made to blinded assessment of Montreal classification groups, duration of disease, patient age, Physician’s Global Assessment (scale 1 to 4), clinical assessment of inflammation (scale 1 to 4), likelihood of clinically-significant structure (scale 1 to 5), clinical assessment of severity of fibrosis (scale 1 to 5) and the Harvey-Bradshaw Index of severity (HBI). RESULTS The mean age of patients was 32 ± 2.06 years. The mean duration of disease was 6.56 ± 4.5 years. Based on the Montreal classification 8 patients were B1 (inflammatory), 12 were B2 (stricturing) and 14 were B3 (fistulizing). 62% were on disease modifying therapy at the time of scan. The mean MTR in the diseased bowells was 22.69 ± 0.98. Patients with higher likelihood of fibrotic disease based on clinical criteria had a higher MTR than patients with less likelihood of fibrosis (24.27 ± 1.25 vs 19.37 ± 0.89, p=0.008). Patients with inflammatory phenotype based on the Montreal Classification had a trend to a lower MTR than patients with a structuring phenotype (20.59 ± 1.63 vs. 24 ± 1.20). MTR did not correlate with duration of disease or HBI. CONCLUSION MT can be performed during routine MRE in patients with CD. MTR is higher in patients with higher likelihood of fibrosis based on clinical criteria. This suggests that, like findings in animal models, MTR may be more sensitive to fibrosis than inflammation and can be used to monitor changes fibrosis over time. MT has the potential to detect predominantly fibrotic strictures and may be useful for determining appropriate disease management.

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A Novel Means of Assessing Bone Mineral Density and Bone Strength in Patients With Inflammatory Bowel Disease Undergoing CT Enterography

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Background: Osteoporosis and bone fractures have an increased prevalence in patients with inflammatory bowel disease (IBD). Screening rates, utilizing dual X-ray absorptiometry (DXA) imaging, remain low in this population. Biomechanical CT (BCT) is a new technique that can measure bone mineral density (BMD) and bone strength from non-contrast CT images, can identify patients with low bone strength who are at high risk of fracture, and correlates highly with DXA BMD. This study seeks to determine if this advanced technology can be applied to patients with IBD undergoing CT enterography (CTE) with intracontrast venous injection. Material and Methods: Patients ages 18 years or older with an established diagnosis of IBD who underwent a CTE and DXA scan within 30 days of each other between 2007 and 2011 were included. Individuals with metallic implants in the pelvis or with a BMI ≥ 30 were excluded. Femoral neck BMD (g/cm2) and T-scores were measured and compared between CTE and DXA modalities. Femoral strength was also determined from CTE images and BCT sequences, with and without MT respectively, were obtained. 34 patients with small intestinal disease where MT could be reliably linked to diseased small bowel were included. Measurements of MTR in the affected bowells and in paraspinal muscles was performed. Correlation was made to blinded assessment of Montreal classification groups, duration of disease, patient age, Physician’s Global Assessment (scale 1 to 4), clinical assessment of inflammation (scale 1 to 4), likelihood of clinically-significant structure (scale 1 to 5), clinical assessment of severity of fibrosis (scale 1 to 5) and the Harvey-Bradshaw Index of severity (HBI). RESULTS The mean age of patients was 32 ± 2.06 years. The mean duration of disease was 6.56 ± 4.5 years. Based on the Montreal classification 8 patients were B1 (inflammatory), 12 were B2 (stricturing) and 14 were B3 (fistulizing). 62% were on disease modifying therapy at the time of scan. The mean MTR in the diseased bowells was 22.69 ± 0.98. Patients with higher likelihood of fibrotic disease based on clinical criteria had a higher MTR than patients with less likelihood of fibrosis (24.27 ± 1.25 vs 19.37 ± 0.89, p=0.008). Patients with inflammatory phenotype based on the Montreal Classification had a trend to a lower MTR than patients with a structuring phenotype (20.59 ± 1.63 vs. 24 ± 1.20). MTR did not correlate with duration of disease or HBI. CONCLUSION MT can be performed during routine MRE in patients with CD. MTR is higher in patients with higher likelihood of fibrosis based on clinical criteria. This suggests that, like findings in animal models, MTR may be more sensitive to fibrosis than inflammation and can be used to monitor changes fibrosis over time. MT has the potential to detect predominantly fibrotic strictures and may be useful for determining appropriate disease management.

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CT Based Predictive Model for Differentiation of Crohn’s Disease From Intestinal Tuberculosis

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Background: Intestinal tuberculosis (ITB) and Crohn’s disease (CD) have close clinical, radiological, endoscopic, and histological resemblance. There is lack of literature on computed tomography (CT) in differentiating between CD and ITB. METHODS: From October 2010 to Jan 2012 all patients with IBD and CD, who underwent CT enteroclysis/CT enterography/CT abdomen were recruited in the study, and all findings were recorded as per the proforma. The gold standard for diagnosis of CD and ITB were ICCO guidelines and Paustian’s criteria respectively. The CT images were evaluated by 2 independent observers who were blinded to the diagnosis. Results: One hundred eleven patients were included in the final analysis (60 CD, 51 ITB, mean age 36±14.2 years vs 34±13.3 years, p=0.36). Significantly more patients with ITB had short segment involvement (70.6% vs 26.7%, p < 0.001), ileocolic involvement (49% vs 18.3%, p=0.01), <3 segment involvement (84% vs 63.5%, p=0.002), and lymph nodes >1cm in size (19.6% vs 1.7%, p<0.001). Patients with CD had significantly greater long segment involvement (61.7% vs 27.5%, p=0.008), presence of Cobbi’s sign (40% vs 19.6%, p=0.02), colonic involvement (35% vs 19.6%, p=0.072) and >3 segments involved (25% vs 19.6%, p=0.138). Based on above features predictive models were developed which could differentiate ITB and CD with > 90% accuracy. Conclusions: Predictive models based on combination of CT findings to differentiate CD and ITB were developed, and they achieved an accuracy of >90%. Table 1: Diagnostic accuracy of combination of various features in predicting ITB or CD of CTE exams for BMD and bone strength could potentially improve osteoporosis screening rates in IBD patients and alter management plans.
Apples Are Higher Risk Than Pears: Subcutaneous Fat Measurement Using Analytic Morphomics and the Risk of Infections Complications in Abdominal Surgeries for Crohn's Disease


BACKGROUND/AIMS: In decision-making for medical vs. surgical therapy in Crohn's disease (CD), it is important to consider the likelihood of serious post-operative complications. Body habitus and BMI have been implicated as important factors for incurring post-operative complications, however these factors have undergone limited studies in CD. Analytic Morphomics is a novel method of computational image analysis providing quantifiable and reproducible measurements of organs and body tissues. The aim of this study was to determine whether morphometric assessment of body tissues was predictive of major infectious complications following CD-related surgeries. METHODS: We conducted a retrospective review of a large tertiary center's medical records to identify adults with a diagnosis of CD (ICD 555.x) who underwent Crohn's-related abdominal surgery from 2000-2010. Charts were reviewed to verify the diagnosis of CD, medications, demographics, laboratory data, and outcomes. CT scans within 30 days of surgery underwent analytic morphometric analysis for fat and muscle quantification and total body cross-sectional area at several spinal levels. Surgical outcomes of 1) placement of a new post-operative abdominal drain, 2) use of intravenous antibiotics for greater than 10 days, or 3) re-operation within 30 days were considered infectious complications. Logistic regression was used to model these outcomes, focusing on clinical predictors and image-based measures of abdominal fat and muscle. The best models were chosen using pseudo-R^2 in StatA 11. RESULTS: There were 269 subjects identified with complete data on 229 subjects, infectious complications occurred in 23%. Univariate analysis showed that total body albumin, surgery type, distribution of subcutaneous fat and body area, but not psoas area, BMI, prednisone use, or anti-TNF use were predictors of infectious complications. A multivariate model including hemoglobin, the distribution of subcutaneous fat and body area, and admission on a low risk day produced a c-statistic of 0.76. The PPV of the model was 71.4%, and the area at T12 compared to L3 (an "apple" shaped distribution of abdominal fat) increases risk, with an odds ratio of 1.2 fold decrease in microbial richness (p=0.01) when compared to HC, whereas IBS patients without bloating also displayed a significant decrease in microbial richness in IBS patients without bloating. ANOVA analysis showed quantitative differences between IBS with bloating, IBS without bloating and HC. This separation was mostly in the first dimension (X-axis) implying a significant association of the microbiota with bloating. ANOVA analysis showed quantitative differences between IBS with bloating, IBS without bloating and HC. This separation was mostly in the first dimension (X-axis) implying a significant association of the microbiota with bloating. ANOVA analysis showed quantitative differences between IBS with bloating, IBS without bloating and HC. This separation was mostly in the first dimension (X-axis) implying a significant association of the microbiota with bloating. ANOVA analysis showed quantitative differences between IBS with bloating, IBS without bloating and HC. This separation was mostly in the first dimension (X-axis) implying a significant association of the microbiota with bloating. ANOVA analysis showed quantitative differences between IBS with bloating, IBS without bloating and HC. This separation was mostly in the first dimension (X-axis) implying a significant association of the microbiota with bloating. ANOVA analysis showed quantitative differences between IBS with bloating, IBS without bloating and HC. This separation was mostly in the first dimension (X-axis) implying a significant association of the microbiota with bloating. ANOVA analysis showed quantitative differences between IBS with bloating, IBS without bloating and HC. This separation was mostly in the first dimension (X-axis) implying a significant association of the microbiota with bloating. ANOVA analysis showed quantitative differences between IBS with bloating, IBS without bloating and HC. This separation was mostly in the first dimension (X-axis) implying a significant association of the microbiota with bloating. ANOVA analysis showed quantitative differences between IBS with bloating, IBS without bloating and HC. This separation was mostly in the first dimension (X-axis) implying a significant association of the microbiota with bloating.