



INDIANA UNIVERSITY
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Correlation of CT Enteroclysis with Surgical Pathology in Patients with Crohn's Disease

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Background:

- The response to medical therapy in patients with Crohn's disease (CD) depends on the underlying inflammatory or fibrostenotic pathology.
- Standard diagnostic methods cannot distinguish between these two phenotypes.
- CT enteroclysis (CTE) has superior small bowel resolution.
- The ability of CTE to differentiate pathological lesions in CD is unknown.

Aims:

- To determine the accuracy of CTE compared to pathology in patients who underwent surgery for CD
- To assess the correlation of specific CTE findings with the pathological diagnosis.

Methods:

- CTE findings from 44 adult patients who underwent surgery for CD were compared to the gold-standard surgical pathology
- The accuracy of CTE was determined by using a composite inflammatory and fibrostenotic score.
- The correlation between CTE variables and surgical pathology was assessed using Mantel-Haenszel chi-square, Spearman correlation and logistic regression analyses.

CTE Variables

Inflammation

Mucosal enhancement
Mural stratification
Wall thickness (mm)
Wall enhancement
Comb sign
Adenopathy

Fibro-stenosis

Thick non-enhancing wall
Luminal stenosis
Pre-stenotic dilation

Pathology variables

Inflammation (macro or microscopic)

Erosions or ulcerations
Mucosal inflammation
Cryptitis
PMN and mononuclear infiltrates
Lymphadenopathy

Fibro-stenosis

Fibrosis
Muscular hyperplasia
Strictures

The final score was calculated as the sum of individual variables for each lesion resected (0-3 for inflammation; 0-2 for fibrosis)

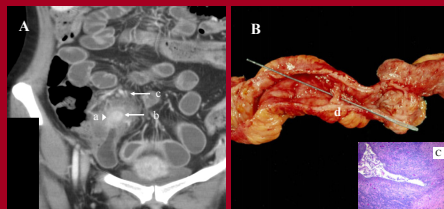


Fig 2: Example of a predominantly inflammatory lesion: A) CTE; B, C) Pathology specimen
Inflammatory score: 3; Fibrostenotic score: 1
a) wall thickening; b) mucosal enhancement; c) comb sign; d) transmural fissure

Results:

Table 1: Demographic information on n=44 patients included

Age	35 (21-79)
Male	39%
Disease duration (years)	8 (1-37)
Indications for surgery	
Bowel obstruction	21
Perforating disease	13
Refractory non-obstructive disease	15
Data presented as median (range)	

Table 2: Accuracy of CTE Compared with Surgical Pathology

	Sensitivity (%)	Specificity (%)	Accuracy (%)
Inflammation if CTE Inf score ≥ 2	94	79	87.2
Fibrosis if CTE FS score ≥ 1	95	83	89.4

*Inf = inflammation; FS = fibrostenosis

Table 3: Association of CTE variables with Surgical Pathology

	n	Path Inflammation (p-value)	Path Fibrostenosis (p-value)
Mucosal enhancement	12	0.042	0.18
Mural stratification	13	0.29	0.68
Wall thickness	45	0.046	0.21
Wall enhancement	25	0.086	0.93
Comb sign	47	<0.0001	0.82
Adenopathy	47	0.016	0.88
Stenosis (yes/no)	47	0.55	0.001
Stenosis length	29	0.7	0.76
Stenosis severity	38	0.49	0.07
Pre-stenotic dilation	40	0.38	0.44

*Mantel-Haenszel chi-square association analysis

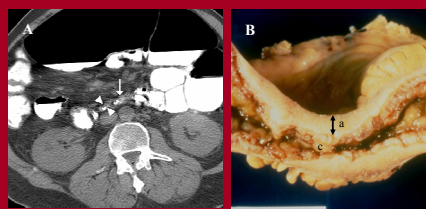


Fig 1: Example of a predominantly fibrostenotic lesion: A) CTE; B) Pathology specimen
Severe luminal narrowing (arrowhead) with minimal mucosal enhancement (arrow)
Inflammatory score: 1; Fibrostenotic score: 3

Fig 3: Spearman rank correlation of CTE with Surgical Pathology: A: Inflammation B: Fibrostenosis

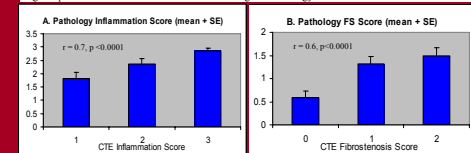


Table 4: Logistic regression analysis of CTE – Pathology associations

CTE variable	n	Path Inf score		Path FS score	
		OR	p-value	OR	p-value
Mural stratification	13	1.86	0.29	1.4	0.67
Wall enhancement	25	2.24	0.09	0.95	0.93
Comb sign	46	5.52	0.0003	1.11	0.82
Adenopathy	47	2.69	0.02	1.07	0.88
Stenosis	47	0.77	0.54	5.87	0.006
Pre-stenotic dilation	40	0.71	0.38	2.0	0.22

Conclusions:

- CTE can reliably differentiate between inflammatory and fibrostenotic lesions in patients with small bowel CD
- Specific CTE variables correlate with each CD phenotype
- Further prospective studies evaluating CTE in CD are warranted.

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