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The Columnar Cuff, Anal Transitional
Zone and Ileal Pouch Mucosa in
Restorative Proctocolectomy

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Submitted for the degree of Doctor of Medicine

University of Auckland 2003

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Abstract

The formation of a pelvic ileal reservoir or pouch for patients requiring a proctocolectomy for ulcerative colitis or familial adenomatous polyposis (FAP) has gained rapid favour over recent years. The operation has evolved by empiric practice with the progressive refinement of operative technique. There is still debate over whether to retain or remove the anal transitional zone (ATZ). This debate relates to concern about the neoplastic and inflammatory potential of diseased mucosa if retained in the anal canal. Similarly the chronic inflammatory changes observed in ileal pouch mucosa have raised the possibility that neoplasia may be a long term consequence of forming the ileum into a pouch. This thesis investigates these issues.

The work begins with a review of the literature on the ATZ and its importance in restorative proctocolectomy. Following this a detailed study of the micro anatomy of the anal canal is carried out on 28 anal canals. The median span of the ATZ was found to be only 4.5 millimetres and it contains almost no columnar epithelium. However an important area termed the columnar cuff was identified. In a patient who does not have a mucosectomy, the columnar cuff constitutes a span of diseased columnar epithelium extending over 1.5 to 2.5 cm in the upper anal canal. Long term concerns need to focus on the columnar cuff rather than the ATZ.

The columnar cuff and ATZ in 113 patients with an ileal pouch has been studied. These patients had an examination with the intention of biopsying the anal canal and ileal pouch to study the ATZ and columnar cuff. It was possible to obtain a successful biopsy of the columnar cuff in 72% of cases. The technique of staining for the small bowel brush border enzyme sucrase isomaltase has been developed and shown to reliably distinguish between pouch mucosa with villous atrophy and columnar cuff mucosa. The same group of patients was followed over a 2.5 year period and 9% were shown to have symptomatic 'cuffitis'. A histological scoring system is described and a diagnostic triad of symptoms, endoscopic inflammation and acute inflammation on histology is put forward as a way to diagnose cuffitis. The same 113 patients had columnar cuff biopsies examined for dysplasia and aneuploidy at a mean of 2.5 years after pouch formation and 10.1 years after the diagnosis of ulcerative colitis. No dysplasia was found but one patient had aneuploidy in the columnar cuff.

The final part of the work focuses on investigating the risk of neoplasia in ileal pouches. This work draws on a large cohort of 1221 patients with an ileal pouch and selects out a potentially higher risk group for pouch neoplasia. 106 patients who had a pouch for ulcerative colitis were selected, including 34 with chronic pouchitis. In addition 33 patients who had a pouch for FAP were studied. In the ulcerative colitis group one patient was found to have low grade dysplasia and aneuploidy and a further two patients aneuploidy. The risk of neoplasia in an ileal pouch for ulcerative colitis appears low and chronic pouchitis was not identified as a particular risk factor. In contrast adenomatous polyps were found in the ileal

pouch of 42% of patients with FAP. It appears that forming the terminal ileum into a reservoir promotes the formation of ileal polyps.

In conclusion forming the ileum into a pelvic reservoir to maintain continence appears to be a safe procedure with medium term follow up. It will be important to continue to gather data to establish the natural history of an ileal pouch. In the interim a level of follow up and surveillance for some groups of patients may be wise.

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Acknowledgements

As the last three years have passed after returning to New Zealand I reflect on my years in Oxford and Toronto with increasing gratitude. I am thankful for the privilege of being warmly received and mentored by truly clever colleagues, that I have a great respect for.

Firstly I am indebted to Neil Mortensen for providing me with the opportunity to enter into research, which made this work possible. His confidence in me and provision of funding from the John Radcliffe Colorectal Research Trust Fund felt to me to be more than I deserved. He generously gave time, patient guidance and wise advice that was never short of being on target. In addition to his professional generosity, he provided opportunities and frequently 'shelled out' to help me enjoy the 'Oxford scene', which was certainly appreciated. I owe much to Bryan Warren for hugely expanding my knowledge of gastrointestinal pathology, always having his office door open with coffee available, and being an unstoppable enthusiast. Most importantly, Bryan spent many hours at all times of the day and night, going through hundreds and hundreds of histology slides with me, the results of which are presented in this work. Rebecca Snaith, without ever complaining, provided most of my IT training and support in the early days, was always there to help, and provided company in the office. I must thank and acknowledge the friendly assistance and tuition provided by the Medical Scientific Laboratory Officers in the Department of Pathology at the John Radcliffe Hospital. The multidisciplinary collegiality I was privileged to experience and enjoy set the model for me to develop a multidisciplinary approach to Colorectal Surgery both academically and clinically.

The closing chapters of this thesis took place in Toronto at the Mt Sinai Hospital. This brought important experience on the other side of the Atlantic. My thanks go to Robin McLeod and Zane Cohen for making this possible. Robin's sense of humour, exacting standards, thorough approach and incisive mind ensured a successful and rewarding time. I thank Mark Redston for suffering endless harassment but always remaining cheerful as I consumed his precious time for assistance with pathology. Vicki Marcus generously and patiently guided me through many pouch biopsies. Erin Kennedy filled the role of great office mate, and gave friendship, and was a great help setting up.

Finally thanks go to my family. My parents Eric and Elizabeth gave me the educational opportunities, support and encouragement to achieve from my early years. Most importantly, my wife Michelle has been a role model as a critical thinker, and in addition a valuable advisor on practical matters. More recently she has provided unfailing encouragement and support to help me reach the finishing line under considerable competing pressures. Daizy, our daughter, is the new member in the family, and what can I say, she puts all in perspective, and dissolves any stress with just one grin.

Publications arising from this work

Risk of dysplasia in long-term ileal pouches and pouches with chronic pouchitis.
M W Thompson-Fawcett, M Redston, V Marcus, Z Cohen, R S McLeod, *Gastroenterology* 2001; 121:275-81

Adenomatous polyps develop commonly in the ileal pouch of patients with familial adenomatous polyposis.
M W Thompson-Fawcett, M Redston, V Marcus, Z Cohen, R S McLeod, *Diseases of the Colon and Rectum* 2001; 44:347-53

Aneuploidy and columnar cuff surveillance after a stapled ileal pouch anal anastomosis in ulcerative colitis.
M W Thompson-Fawcett, B F Warren, N J Mortensen. *Diseases of the Colon and Rectum*, 2000; 43:408-13

Cuffitis and inflammatory changes in the columnar cuff, anal transitional zone and ileal reservoir after a stapled pouch anal anastomosis.
M W Thompson-Fawcett, B F Warren, N J Mortensen. *Diseases of the Colon and Rectum* 1999; 42:348-55

A new look at the anal transitional zone: with reference to the columnar cuff and restorative proctocolectomy.
M W Thompson-Fawcett, B F Warren, N J McC Mortensen. *British Journal of Surgery* 1998; 85:1517-21

Ileoanal reservoir dysfunction: a problem solving approach.
M W Thompson-Fawcett, D P Jewell, N J McC Mortensen. *British Journal of Surgery* 1997; 84:1351-1359.

The anal transitional zone and columnar cuff in restorative proctocolectomy.
M W Thompson-Fawcett, N J McC Mortensen. *British Journal of Surgery* 1996; 83:1047-55

Awards arising form this work

- American Society of Colon and Rectal Surgeons 2000, 'Impact paper' for 1999 in the field of surgery for inflammatory bowel disease. Announced at the American Society of Colon and Rectal Surgeons, Boston June 2000 for: 'Cuffitis and inflammatory changes in the columnar cuff, anal transitional zone and ileal reservoir after a stapled pouch anal anastomosis.' M W Thompson-Fawcett, B F Warren, N J Mortensen. *Diseases of the Colon and Rectum* 1999; 42:348-55
- Royal College of Physicians and Surgeons of Canada, prize for the best paper, Section of Surgery, Annual Meeting, September 23-26, 1999, Vancouver, Canada
- Falk symposium: IBD at the end of its first century. Award for 'Best unpublished data contributed by a young scientist' in 'Surgical therapy for IBD' section. Freiburg, Germany, June 18-20. 1999
- Royal Society of Medicine Section of Coloproctology poster prize at the Tripartite Meeting (Great Britain and Ireland, American and Australasian Colorectal Surgery Associations and Societies), July 8-10 1996, London
- Royal Society of Medicine Section of Coloproctology Travelling Fellowship, May 1996 for work on the anal transitional zone.

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