Patients With Acromegaly Have Longer Colons and are More Difficult to Colonoscope Than Normals

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Background

A previous barium enema study suggested that patients with acromegaly have longer colons than normal patients and therefore might be more difficult to colonoscope [1].

We have previously used a combination of magnetic endoscope imaging (MEI) and specially developed software to accurately measure the lengths of different sections of the colon at the time of colonoscopy [2-5].

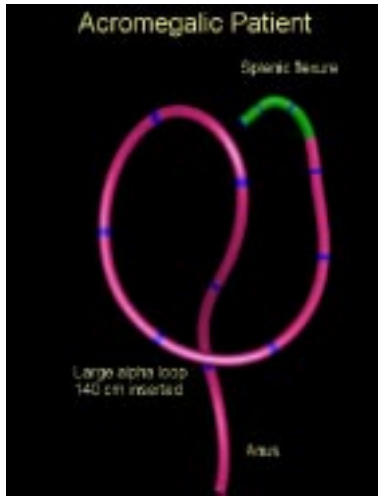

Figure 1 - Use of the MEI to show a very large alpha loop forming in the sigmoid colon of an acromegalic patient. The blue bands show the site of the sensors and the distal 11.5 cm bending section is shown in green.

As part of a larger study looking at the incidence of adenomatous polyps and CRC in acromegalic patients [6], one of us (JEP) had an opportunity to use the MEI system in a series of 25 patients and 45 control patients.

Aims

To establish if acromegalic colons are significantly longer than normal and, if so, whether colonoscopy is any more difficult.

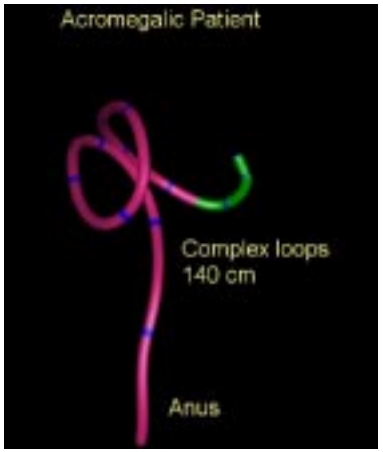

Figure 2 - Use of EMI to show another example of a complex sigmoid loop forming in an acromegalic patient.

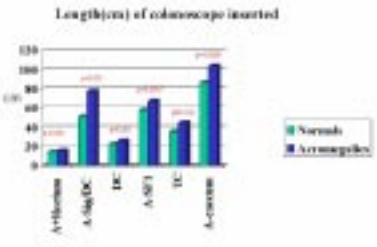

Figure 3 - Use of the EMI system with modified software (see references 3 and 4) to estimate the lengths in cm of different segments of the colon of normals (green bars) or acromegalic patients (blue bars). There were highly significant differences between the two groups.

Methods and Results

We used our MEI system in a series of 25 patients with acromegaly (AP) and 45 patients without acromegaly (NP) who were colonoscoped by a single experienced endoscopist (JEP).

One MEI image was stored per second for later analysis.Two of us (GDB and RSR) uused specially modified software [3,4] to measure the following :-

1) length of rectum and anal canal combined
2) length of anus to sigmoid descending junction
3) length of descending colon
4) length from anus to point when splenic flexure first reached
5) length of transverse colon from splenic flexure to point when hepatic flexure first reached
6) length from anus to caecum after shortening
7) maximum length of colonoscope inserted at any stage of procedure
8) time in seconds to pass from anus to splenic flexure b) traverse the transverse colon and c) go from anus to caecal pole.

Pelvic loop formation in normals and acromegalic patients

	Normals	Acromegalics
Alpha or reverse alpha	*1*	*5*
N-loop	*14*	*7*
Sigmoid loop	*20*	*11*
No loop	*9*	*1*

If the tendency to form simple loops such as sigmoid or N-loops is compared with more complex alpha or reverse alpha loops then Fisher's exact test is significant (p=0.032)

Table 1 - Pelvic loop formation in normals and acromegalic patients. It can be seen that the longer sigmoid colons of the acromegalics were more inclined to form more complex loops such as alpha or reverse alpha loops than normal patients.

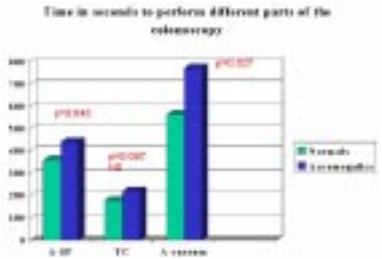

Figure 4 - Time in seconds to pass the colonoscope from a) anus to splenic flexure b) across the transverse colon and c) from anus to cacum. In the case of a) and c) it took significantly longer in acromegalics than normal patients.

The acromegalic patients took longer to colonoscope, had longer colons and formed more complex pelvic loops – please see figures 1 - 4 and the table. Total colonoscopy was recorded in 21 (84%) AP and in 43 (95.6%) NP using MEI.
The median maximum length of colonoscope inserted was 127.5cm (110-155.1) in AP compared to 110cm (105-120) in NP (p=0.0023). The greatest difference was in the median length of colonoscope inserted to reach the sigmoid-descending junction, 78.5cm (62.9-94.1) in AP compared to 51.3cm (42.4-61.5) in NP (p<0.0001).The median time to the caecum was 772sec (613.5-1063) in AP compared to 563.5sec (400.8-853.6) in NP (p=0.0267, Mann Whitney U).

Conclusion

Patients with acromegaly are more difficult to colonoscope than normal patients because they have longer colons, which are more prone to loop formation.

These patients should be colonoscoped by experienced colonoscopists using full length instruments. Where possible, access to either screening facilities or MEI is recommended so that a stiffening overtube can be used if necessary.

References

1. Stellini M, Jenkins P, Fairclogh P, Besser G M, Sanderson JD, Murphy GM, Dowling R H. Colorectal Neoplasia in Acromegaly: Role of serum IGF-1 and of polyamines and cell proliferation in the colonic mucosa" Gut 1999; 44(suppl 1) A141.

2. Bladen JS, Anderson AP, Bell GD, Rameh B, Evans B, Heatley DJT. Non-radiological imaging of endoscopes. Lancet 1993;341:719-722.

3 Rowland RS & Bell GD. Non-radiological technique for three dimensional imaging of intestinal endoscopes - A new improved method of computerised graphical 3-D representation of the endoscope and patient's skeleton . Med.Biol.Eng.Comput., 1998;36:285-290.

4. Rowland RS, Bell GD, Dogramadzi S, Allen C. Validation of a 3-D method of accurately measuring the insertion depth of different anatomical sections of the colon during flexible endoscopy. Gut 1999; 44 (Suppl 1) A22.

5. Rowland RS, Bell GD, Dogramadzi S, Allen C. Colonoscopy aided by magnetic 3D imaging - Is it sufficiently accurate to detect differences between men and women? Med. Biol. Eng. Comput., 1999; 37:673-679.

6. Renehan A G, Bhaskar P, Painter J E, O'Dwyer S T, Haboubi N, Varma J, Ball S G, Shalet S M. The prevalence and characteristics of Colorectal Neoplasia in Acromegaly. J Clin Endocrinol Metab 2000;85(9):3417-24.