Endocuff vision vs. standard colonoscopy in the FOBT based UK Bowel cancer screening programme (E-cap study): A randomized trial


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Abstract

Background and Aims
Up to 25% colorectal adenomas are missed during colonoscopy. Our aim was to see if the Endocuff™ vision could improve polyp detection in an organised bowel cancer screening programme (BCSP).

Methods
Parallel group, single blinded, randomised controlled trial. FOBT positive patients who were attending for BCSP colonoscopy were eligible for inclusion. The primary outcome was the number of polyps per patient. Secondary outcomes included the number of adenomas per patient, adenoma and polyp detection rates and withdrawal times.

Results
534 BCSP patients were randomized to endocuff vision (EC) or standard colonoscopy (SC). The mean age was 67 years and the man to woman ratio was 1.8:1. We detected no significant difference in the number of polyps per patient (SC 1.77; EC 1.64; p=0.441), adenomas per patient (SC 1.35; EC 1.26; p=0.536), polyp detection rate (SC 69.8%, EC 70.3%; p= 0.925), adenoma detection rate (SC 63%, EC 60.9%; p= 0.851), advanced adenoma detection rate (SC 18.5%, EC 16.9%; p=0.81) and cancer detection rate (SC 5.7%, EC 5.3%; p= 0.851).

The mean withdrawal time was significantly shorter among patients in the EC compared to SC group (16.85 vs. 19.47 minutes; p<0.005). The endocuff had to be removed in 17 (6.4%) of patients because of inability to pass through the sigmoid colon.

Conclusions
This study did not find an improved polyp or adenoma detection with endocuff vision assisted colonoscopy in the FOBT positive BCSP population. A shorter withdrawal time with EC may reflect improved views and stability provided by the endocuff vision.
Introduction

Bowel cancer is the third most common cancer in the UK and the second leading cause of cancer deaths [1]. Colonoscopy and the endoscopic removal of adenomas reduce colorectal cancer mortality [2,3,4]. For every 1% increase in ADR there is a 3% decrease in the risk of interval colorectal cancer [5].

The UK Bowel cancer-screening programme (BCSP) uses faecal occult blood test (FOBt) to select high-risk subjects for full colonoscopy.

However, colonoscopy has an inherent adenoma miss-rate of up to 25%[6]. Keeping this in mind, colonoscopy in English BCSP is restricted to very select colonoscopists who have been carefully selected based on their large life time experience, excellent performance indicators and then accredited by undergoing a theory based exam and a clinical assessment.

Modification of endoscopic technique, such as by increasing withdrawal times [7] have been shown to increase lesion detection. The use of smooth muscle relaxants, such as hyoscine butylbromide, has shown mixed results [8]. In addition, a number of technologies and devices have been shown to improve polyp detection [9,10,11,12]. However, none have translated yet to mainstream practice, as we still need well designed trials to prove the superiority and cost-effectiveness of devices over the expertise of a well trained colonoscopist.

The endocuff vision (figs. 1-3) is a disposable device that attaches to the end of the colonoscope. It has a single horizontal row of soft, flexible arms that remain collapsed during insertion but flare out on withdrawal to engage mucosal folds and flexures. This allows inspection of otherwise challenging areas and improves scope stability. It is a modification of the first-generation endocuff, which had 2 rows of flexible arms.
Results from randomised controlled trials of the first generation endocuff have demonstrated mixed success. Floer et al. demonstrated a 14.7% increase in ADR compared to standard colonoscopy. Van Doorn et al also reported an increase in adenoma detection rate but no difference in mean adenomas per patient and a lower caecal intubation rate when comparing endocuff with standard colonoscopy [13]. These studies did not specifically address the screening population and did not have strict standardisation of the endoscopist’s expertise.

There are currently no studies investigating such devices within a screening population, where the gains could potentially be the greatest. We performed the first randomised controlled trial, comparing endocuff vision with standard practice in an organised bowel cancer screening programme where the colonoscopy was performed by accredited experts.

**Aims and objectives**
The aim of the study was to establish if endocuff vision assisted colonoscopy improved polyp detection in the Bowel cancer screening population.

**Methods**

**Study design**
This was a parallel group, single blinded, randomised controlled trial carried out at a UK based bowel cancer screening centre. Ethics approval was obtained (ref: 14/SC/0207). The trial was adopted on to the National Institute of Health Research (NIHR) portfolio – UKCRN ID: 16985. The trial was listed on clinicaltrials.gov - NCT02529007.

**Participants**
All patients attending for Bowel cancer screening programme (BCSP) colonoscopy from 10-9-2015 to 10-9-2016 were included, provided they were able and willing to provide written informed consent. These patients were between 59 and 75 years of age and had a positive faecal occult blood test.
Patients with a history of inflammatory bowel disease or polyposis syndromes were excluded.

Colonoscopists
All procedures were performed by accredited bowel cancer screening colonoscopists. Screening colonoscopists need to have a minimum lifetime experience of 1000 colonoscopies and fulfil key performance criteria for sedation and adenoma detection, before they are eligible to undergo the screening programme accreditation process. This involves a theory test and then a practical assessment involving two real time colonoscopy procedures assessed by two independent external assessors.

Colonoscopy procedure and pathology
The colonoscopists in the study performed at least 15 endocuff vision assisted colonoscopies before the commencement of the trial. Colonoscopy in both arms was standardised with the use of Olympus Spectrum CV260SL processor, Olympus CF-H260 endoscopes, CO2 and Olympus scope guide. Procedures were performed under conscious sedation with IV midazolam and fentanyl. All patients received buscopan (hyoscine butylbromide) on reaching caecum and had standard position changes during withdrawal (cecum, ascending colon, and hepatic flexure: left lateral; transverse colon: supine; splenic flexure and descending colon: right lateral) [14]. The protocol for removing polyps and sending pathology specimens did not differ in any way from normal clinical practice. Pathology was reported by specialist gastrointestinal pathologists in an accredited NHS hospital laboratory (Clinical Pathology Accreditation (CPA) ISO 15189). The pathologist was blinded to the use of endocuff vision. An independent member of the research team recorded colonoscopy data directly on a case report form.

Powering
Data from our centre’s bowel cancer screening in previous years showed an average of 1.6 polyps detected per patient with a standard deviation of 2.05. Based on previous studies, we postulated that endocuff vision could increase the
polyp detection by 30%. To detect an absolute difference between mean counts per person of 0.5 with 80% power required 265 participants in each group, 530 in total.

Informed consent and randomisation
Patients invited for BCSP colonoscopy were provided the study information one week prior to their colonoscopy. On the day of the procedure, a good clinical practice (GCP) certified researcher met with the patient to obtain informed consent.

Randomisation
Participants were stratified into two groups: those attending for index colonoscopy (screening population) or attending for surveillance (surveillance population) following previous polypectomy within the BCSP. Within each population, participants were randomised to either the standard colonoscopy (SC) or endocuff vision assisted colonoscopy (EC) arm. Randomisation was performed in a 1:1 ratio among the two study arms using random permuted blocks of randomly varying sizes. The successive participants were given a sequential study number and then assigned to the associated intervention from the random list. The generated list was concealed in sequentially numbered sealed opaque envelopes, which were only opened to reveal the allocation after verifying that the participant was eligible and had consented to enter the trial. The participant was blinded to the allocation but not the endoscopist.

Outcome measures and analysis
The primary endpoint of the study was the mean polyps per patient (MPP), defined as the total number of polyps divided by the total number of patients in that group.

The secondary endpoints included polyp detection rate (PDR – the number of procedures in which at least 1 polyp was detected), adenoma detection rate (ADR – the number of procedures in which at least 1 adenoma was detected), advanced adenoma detection rate (AADR – the number of adenomas >10mm in
size), mean adenomas per patient (MAP – total number of adenomas divided by the total number of patients in that group) and cancer detection rate (total number of cancers divided by the total number of patients in that group). Fisher’s exact test was used to compare these outcomes.

The caecal intubation times and total procedure times were recorded. Withdrawal times (time taken from the start of withdrawal to the end of the procedure) were compared between the two arms. A log rank test was used to compare withdrawal times.

It can be challenging to get adequate views of the distal rectum and anal canal. We wanted to see if the endocuff vision could improve views in these challenging areas. Endoscopists were asked to grade the views of the dentate line and anal canal on direct withdrawal in forward view as excellent, adequate or poor for all the procedures. A Chi-square test was used to compare these data. Bowel preparation for each colonoscopy was graded as per the 3-point UK bowel prep scoring system: Good, adequate or poor [15].

Comfort scores were graded for all procedures as per the 5-point nurse reported comfort levels (NRCLs) used for UK National Bowel cancer screening colonoscopy procedures ranging from no discomfort to severe discomfort [16]. The distribution of scores across the two arms was compared using a Chi-square test.

**Results**

534 patients were recruited into the study between September 2014 and September 2015. 3 patients were subsequently excluded due to the unexpected finding of hyperplastic polyposis during the colonoscopy. The remaining 531 were included in the final analysis (fig.4).

The average age of the patients was 67 years and the male to female ratio was 1.8:1. Of the patients that were recruited, 371/531 (69.9%) attended for
screening (index) colonoscopy and 160/531 (30.1%) attended for surveillance colonoscopy after previous polypectomies under the organised BCSP (table 1).

265 patients were randomised to standard colonoscopy (SC) and 266 to endocuff vision assisted colonoscopy (EC). Of the 266 patients recruited to EC arm, in 17/266(6.4%) cases the endocuff vision had to be removed when the sigmoid colon was found to be too tortuous to negotiate with it in situ. In 14/17(82.3%) cases, this resolved the problem and the colonoscopy could then be completed.

Polyp, adenoma and cancer detection

Whole population

On intention to treat analysis, 470 polyps (MPP – 1.7) were detected in the SC group as compared to 436 polyps (MPP – 1.6) in the EC group (table 2). There was no significant difference between the 2 groups (p=0.441)

359 adenomas (MAP – 1.3) were detected in the SC group vs. 336 adenomas (MAP – 1.2) in the EC group (p=0.536). The adenomas accounted for 76% of all our polyps.

No significant difference was found between the two groups in polyp detection rate (SC- 69.8%, EC- 70.3%; p= 0.925), adenoma detection rate (SC- 63%, EC- 60.9%; p= 0.851), advanced adenoma detection rate (SC- 18.5%, EC- 16.9%; p=0.81) and cancer detection rate (SC- 5.7%, EC- 5.3%; p= 0.851).

Screening and surveillance populations – sub-analysis

A sub-analysis was performed in the screening and surveillance populations separately. As expected, smaller numbers of polyps were detected in the surveillance population (266 polyps) as compared to the screening population (640 polyps). However, no significant difference was seen between the two study arms for any of these outcomes in either the screening group or the surveillance group.
Polyp size based analysis
A polyp size based analysis was performed to see if there was a difference in the size of polyps detected in the 2 groups (fig.5). A Chi square test indicated that significantly more medium sized (6-10mm) polyps were detected in the SC arm as compared to the EC arm (SC-76, EC-46; p=0.020). There was no significant difference between the 2 arms in the detection of diminutive (<5mm) and large (>10mm) sized polyps.

Endoscopist based analysis
The data for each colonoscopist were evaluated separately to look for any significant differences in lesion detection rates between the four different colonoscopists in the study. When analysing for one endoscopist at a time, no significant difference was found in these outcomes between SC and EC (table 3).

Effect of trial on the performance of the endoscopists (study bias)
We looked at the ADRs of the study endoscopists in the 6 months prior to the start of the study and compared these to their ADRs in the SC arm during the study. Their pre-study ADR averaged 58.9% and did not change significantly during the study.

Withdrawal and intubation times
The mean withdrawal time for all cases in the study was 18.16 minutes. The mean withdrawal time was 19.47 minutes in the SC arm, which was significantly longer from the mean withdrawal time of 16.85 minutes in the EC arm (p<0.005) (table 1)

There was no significant difference in the intubation times between the 2 groups (15.75 minutes for EC vs. 15.89 minutes for SC; p=0.86).

The mean total procedure time was shorter in the EC group (32.8 minutes) as compared to the SC group (35.28 minutes). However, this difference was not statistically significant (p=0.11).
Views of the dentate line and anal canal

Views were graded as excellent in 67.6% patients in the EC group and 61.9% in the SC group. However, this failed to achieve significance. All endoscopists graded the views as excellent more frequently for the EC group. However, the difference from the SC group was not significant (p=0.05).

Comfort scores

Comfort scores were graded for all procedures on a 5-point scale with no discomfort being scored as 0 and severe discomfort scored as 4. A Chi-square test of homogeneity demonstrated no significant difference in comfort scores between the SC and EC arms (p=0.268) with a mean comfort score of 1.57 in the EC group and 1.46 in the SC group.

Complications

No significant complications were seen in either study arm. There was 1 post polypectomy bleed in the SC arm, which was identified immediately and controlled with the application of clips.

Discussion

This is the first randomised controlled trial evaluating any generation endocuff in an organised National bowel cancer screening population.

The endocuff vision did not increase polyp or adenoma yield in the hands of highly experienced colonoscopists in this FOBT positive screening population. The overall mean polyps per patient, mean adenomas per patient, polyp detection rate & adenoma detection rate were similar in the control and EC arms. Our study demonstrated that it was possible to achieve caecal intubation in 93.6% of patients without removing the endocuff vision. There were no safety concerns and it did not increase patient discomfort.

However, the mean withdrawal time was significantly shorter in the EC arm (16.85 minutes vs. 19.47 minutes; p<0.005).
The most significant finding from this study is the lack of an improvement in polyp or adenoma detection with the use of the endocuff vision. Our data demonstrates that if endoscopists have a very high PDR and ADR in a BCSP, then devices like the endocuff are unlikely to be of benefit.

To date, three large randomised controlled trials comparing the first generation endocuff with standard colonoscopy have been published. A large study from the Netherlands with over 1,000 participants suggested a trend towards improved adenoma detection, although this was not statistically significant and there was no significant increase in the number of adenomas per patient with EC [16]. Our study did not suggest any trend towards significance although it should be noted that our patient population was quite different, being entirely FOB positive. It is important to note that the authors in the above study performed a sub-analysis of FIT positive patients and noted no significant difference in adenoma detection (P=0.52). This would be in keeping with our findings, and reflects the importance of examining a device within a specific patient population.

There are a few studies however, that have reported an improvement in polyp/adenoma detection with the endocuff. In a randomised study from Germany with 498 patients, the MPP was significantly better with EC than with SC (2.00 vs. 1.00; p<0.0001) [18]. Another study from the same group showed a significantly improved ADR with EC (35.4% vs. 20.9%; p<0.0001)[19]. Compared to our study, the ADRs in this study were much lower, particularly in the SC arm. Another recent study has also shown improved ADRs with EC (29.6% vs. 26.3%, p<0.01), though the ADRs were again very low [20]. The consistent observation from these studies is a low polyp / adenoma detection in the control arm and the reason behind this is not clear. This could potentially be related to either the endoscopists or population included in these studies. The other observation of note here is that the MPP and ADR in the control arm of the study from the Amsterdam group and our current study are very high and in both these studies the endocuff has shown no improvement in MPP or ADR. Given the above observations, it is not unreasonable to speculate that the observed benefits of
endocuff in some of the studies could be a reflection of poor polyp detection in the control arms, as the reported polyp and adenoma rates in the control arms of these studies is lower than expected. We believe that future studies with similar devices should keep these factors into consideration.

We have reported significantly shorter withdrawal times (15% reduction) in the EC arm as compared to the SC arm. This could be due to improved views and stability provided by the endocuff vision during withdrawal. This is really important, as the endoscopists in the EC arm have detected the same number of polyps and adenomas as in the standard arm but in a much shorter time. The small additional cost of endocuff vision could potentially be neutralized by the reduction in withdrawal and overall procedure times; thereby making colonoscopy more time efficient. Similar findings were observed by the Netherlands group and we suspect that this is not artefactual. However, this needs to be formally evaluated.

There was a trend towards significance in the endoscopists’ grading of mucosal views in the area around the dentate line, with views being graded as excellent in 67.6% patients in the EC group and 61.9% in the SC group (p=0.05).

A surprising finding from our study was a reduction in the number of medium sized (5-10mm) polyps with endocuff vision compared to the standard limb (P=0.020). This could reflect the change in technique required to withdraw using the endocuff vision. Traditional colonoscopy requires repeated reinsertion and withdrawal to visualise all of the folds with maximal distension. To use endocuff vision effectively requires over distension to be avoided to enable the flanges to engage with the folds, and less slippage will make the endoscopist feel less inclined to reinsert and re-examine areas. These findings should be interpreted with caution, as the study was not powered to investigate this. The most likely explanation is that it is a statistical artefact, but it could be a focus for further investigation.

The endocuff vision did not come off in any case and was a good fit for the scope. Difficult sigmoid colons with complex diverticulosis are always challenging.
Since our study population was between 59 and 75 years of age, the prevalence of diverticulosis was high. Despite this the endocuff vision had to be removed in only 6% of patients in order to negotiate a tortuous sigmoid.

The study has a number of strengths. It is the first study to investigate endocuff vision in an organised FOBT based National bowel cancer screening population. It is large and well powered. The endoscopists, colonoscopy technique and the study population are all very well standardised and controlled. We have also controlled for a study related in-trial bias by comparing the pre study ADR of our endoscopists to the ADR during the study. Our endoscopists were experts and very high performing with a baseline ADR of 58.9% in the FOBT positive screening population before the start of the study.

A potential criticism of our study is that the primary end point was polyp rather than adenoma detection rates. However, there is growing data to support the importance of right-sided serrated polyps in the development of cancer. Given that there is a need within bowel cancer screening to reduce right-sided bowel cancer risk it is our contention that ADR is not an adequate measure in this patient population and by looking at all polyps we have taken this into account. Furthermore, endocuff vision is a device designed to find polyps, not to differentiate histology. It is therefore inappropriate to attempt to look simply for adenomas, as it is not an appropriate measure of the effectiveness of the device. In this study, the endoscopists could not be blinded to the randomisation. However, the ADR (63% for SC vs. 60.95% for EC) and the number of adenomas per patient (1.35 for SC vs. 1.26 for EC) were closely comparable. These are the most important surrogate markers of the quality of colonoscopy. Comparable values in the 2 arms therefore make selection/observer bias unlikely. In addition, the in-trial ADRs of the endoscopists compared very closely with the pre-trial ADRs, thus further ruling out in-trial observer bias.

**Conclusion**

This is the first randomised controlled study of the endocuff vision in an organised FOBT based national bowel cancer screening population and showed
no significant difference in polyp or adenoma detection between standard and endocuff vision assisted colonoscopy. The withdrawal times were significantly faster in the EC arm and could be due to improved views and stability provided by the endocuff vision. No significant adverse events were seen. We conclude that whilst endocuff vision is safe and reduces withdrawal time, it does not improve polyp detection during FOBT positive screening colonoscopy in an organised screening programme.
### Table 1. Patient characteristics and withdrawal time

<table>
<thead>
<tr>
<th></th>
<th>SC (n=265)</th>
<th>EC (n=266)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Median age (yrs.)</strong></td>
<td>67 (IQR 64-71)</td>
<td>68 (IQR 63-70)</td>
</tr>
<tr>
<td><strong>Males- n (%)</strong></td>
<td>180 (68%)</td>
<td>162 (61%)</td>
</tr>
<tr>
<td><strong>Indications</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive FoBT- n (%)</td>
<td>183 (69%)</td>
<td>188 (70%)</td>
</tr>
<tr>
<td>Polyp surveillance- n (%)</td>
<td>82 (31%)</td>
<td>78 (29%)</td>
</tr>
<tr>
<td><strong>Good/adequate bowel prep - n (%)</strong></td>
<td>259 (98%)</td>
<td>260 (98%)</td>
</tr>
<tr>
<td><strong>Withdrawal time (all cases) in minutes - mean±SD</strong></td>
<td>19.5±12.2</td>
<td>16.8±8.3</td>
</tr>
</tbody>
</table>

 FoBT, Faecal occult blood test

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### Table 2. Polyp, adenoma and cancer detection

<table>
<thead>
<tr>
<th></th>
<th>SC (n=265)</th>
<th>EC (n=266)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Polyps - n</strong></td>
<td>470</td>
<td>436</td>
</tr>
<tr>
<td><strong>MPP - mean± SD</strong></td>
<td>1.7±2.0</td>
<td>1.6±1.9</td>
</tr>
<tr>
<td><strong>Adenomas - n</strong></td>
<td>359</td>
<td>336</td>
</tr>
<tr>
<td><strong>MAP - mean± SD</strong></td>
<td>1.3±1.5</td>
<td>1.2±1.8</td>
</tr>
<tr>
<td><strong>PDR</strong></td>
<td>69.8%</td>
<td>70.3%</td>
</tr>
<tr>
<td><strong>ADR</strong></td>
<td>63%</td>
<td>60.9%</td>
</tr>
<tr>
<td><strong>Proximal polyps- n(%)</strong></td>
<td>169 (36%)</td>
<td>148 (34%)</td>
</tr>
<tr>
<td><strong>Proximal adenomas- n(%)</strong></td>
<td>140 (39%)</td>
<td>128 (38%)</td>
</tr>
<tr>
<td><strong>Advanced ADR</strong></td>
<td>18.5%</td>
<td>16.9%</td>
</tr>
<tr>
<td><strong>Cancer detection rate</strong></td>
<td>5.7%</td>
<td>5.3%</td>
</tr>
</tbody>
</table>

 MPP, Mean polyps per patient; MAP, Mean adenomas per patient; PDR, Polyp detection rate; ADR, Adenoma detection rate; Advanced ADR, proportion of cases in which at least one adenoma >10mm in size was detected; Proximal, proximal to splenic flexure.

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### Table 3. Results by endoscopist

<table>
<thead>
<tr>
<th></th>
<th>Endoscopist 1</th>
<th>Endoscopist 2</th>
<th>Endoscopist 3</th>
<th>Endoscopist 4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Polyps - n</strong></td>
<td>234</td>
<td>194</td>
<td>138</td>
<td>138</td>
</tr>
<tr>
<td><strong>MPP - mean± SD</strong></td>
<td>1.9±2.2</td>
<td>1.8±2.2</td>
<td>1.5±1.4</td>
<td>1.3±1.5</td>
</tr>
<tr>
<td></td>
<td>P = 0.66</td>
<td>P = 0.11</td>
<td>P = 0.11</td>
<td>P = 0.53</td>
</tr>
<tr>
<td><strong>Adenomas - n</strong></td>
<td>183</td>
<td>156</td>
<td>107</td>
<td>110</td>
</tr>
<tr>
<td><strong>MAP - mean± SD</strong></td>
<td>1.5±1.7</td>
<td>1.4±2.2</td>
<td>1.2±1.2</td>
<td>1.0±1.4</td>
</tr>
<tr>
<td></td>
<td>P = 0.52</td>
<td>P = 0.06</td>
<td>P = 0.06</td>
<td>P = 0.32</td>
</tr>
<tr>
<td><strong>PDR</strong></td>
<td>66.4%</td>
<td>72.2%</td>
<td>75.6%</td>
<td>63.5%</td>
</tr>
<tr>
<td></td>
<td>P = 0.34</td>
<td>P = 0.06</td>
<td>P = 0.17</td>
<td>P = 0.36</td>
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<tr>
<td><strong>ADR</strong></td>
<td>57.4%</td>
<td>62.0%</td>
<td>67.8%</td>
<td>51.4%</td>
</tr>
<tr>
<td></td>
<td>P = 0.47</td>
<td>P = 0.05</td>
<td>P = 0.35</td>
<td>P = 0.93</td>
</tr>
<tr>
<td><strong>Cancer detection rate</strong></td>
<td>4.9%</td>
<td>2.8%</td>
<td>6.7%</td>
<td>5.6%</td>
</tr>
<tr>
<td></td>
<td>P = 0.40</td>
<td>P = 0.75</td>
<td>P = 0.89</td>
<td>P = 0.47</td>
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</tbody>
</table>
Fig. 4 – CONSORT flow diagram

Assessed for eligibility (n=566)

Excluded (n=32) Declined to participate

Randomised (n=534)

Allocated to EC (n=267)
• Received allocated intervention (n=267)
• EC removed (n=19)

Allocated to SC (n=267)
• Received allocated intervention (n=267)

Analysed (n=531)

Analysed (n=266)
• Excluded from analysis (n=1). Hyperplastic polyposis found unexpectedly

Analysed (n=265)
• Excluded from analysis (n=2). Hyperplastic polyposis found unexpectedly
Fig. 5. Polyp size based analysis. 6-10mm polyps: SC – 76, EC – 46; p=0.02

1. www.cancerresearchuk.org/cancer-info/cancerstats/types/bowel/incidence/


**Figures legend**

Figs.1, 2 and 3- Endocuff vision

Fig. 4 – CONSORT flow diagram

Fig. 5. Polyp size based analysis. 6-10mm polyps: SC – 76, EC – 46; p=0.02