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COLONOSCOPIES PERFORMED BY RESIDENT PHYSICIANS IN A UNIVERSITY TEACHING HOSPITAL: A CONSECUTIVE ANALYSIS OF 1000 CASES

Colonoscopias realizadas por médicos residentes em hospital universitário: análise consecutiva de 1000 casos

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ABSTRACT – ***Background*** - Proficiency and competence of endoscopists is perhaps the mainstay of successful diagnostic and therapeutic colonoscopy. ***Aim*** - To analyze indications, diagnostic findings, and complications of colonoscopies performed by resident physicians in a university teaching hospital. ***Methods*** – Were analyzed 1,000 colonoscopies consecutively performed by fourth-year residents under direct supervision of experienced colonoscopists. Information on patients' demographic data, bowel preparation, indications for the procedure, success of the procedure, diagnostic findings, and complications were obtained. ***Results*** - A total of 596 (59.6%) female and 404 (40.4%) male patients were examined. Age ranged from 3 to 99 years (mean 53.8 years). Bowel preparation was performed with 10% mannitol solution in 978 patients (97.8%), being considered appropriate in 97.6% of cases. Main indications were: diagnosis (56.4%), therapy (9.6%), screening (17.3%), and surveillance (22%). Cecal and ileocecal valve intubation rates were 90.3 and 58.6%, respectively. Colonoscopy was normal in 45.8% of cases. The most common diagnosis was diverticulosis (18.5%), followed by polyps (17%) and malignancies (6.8%). Findings consistent with an inflammatory process were identified in 122 patients (12.2%) and vascular abnormalities were detected in 11 patients (1.1%). Other diagnoses accounted for 3.9% of cases. There were two cases (0.2%) of complications (submucosal hematoma and bleeding), both after polypectomy, with no need for surgical intervention. ***Conclusion*** - The residents under supervision and guidance of specialists can perform colonoscopies with excellent success and low complication rates, with final results comparable to those achieved by fully trained endoscopists.

HEADINGS - Professional competence. Endoscopy. Colonoscopy.

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RESUMO - ***Racional*** - A colonoscopia tem indicação para diagnóstico em pacientes sintomáticos e é eficaz no rastreamento e vigiância de pacientes assintomáticos. Tem potencial terapêutico em diversas situções, principalmente na remoção das lesões polipóides. A proficiência e a competência do endoscopista é o esteio para o sucesso da colonoscopia diagnóstica e terapêutica. ***Objetivo*** - Analisar as indicações, os achados diagnósticos, e as complicações de colonoscopias realizadas por médicos residentes em um hospital universitário. ***Métodos*** - Foram avaliadas 1.000 colonoscopias consecutivas realizadas por residentes de quarto ano, sob supervisão direta de colonoscopistas experientes. Foram obtidas informações sobre os dados demográficos dos pacientes, o preparo intestinal, as indicações para o procedimento, o sucesso do procedimento, os achados diagnósticos e as complicações. ***Resultados*** - Foram examinados total de 596 (59,6%) mulheres e 404 (40,4%) homens. A idade variou de três a 99 anos (média 53,8). O preparo intestinal foi realizado com solução de manitol a 10% em 978 pacientes (97,8%), sendo considerada adequada em 97,6% dos casos. Principais indicações foram: diagnóstico (56,4%), terapêutica (9,6%), rastreamento (17,3%) e vigilância (22%). Taxas de intubação do ceco e válvula ileocecal foram 90,3 e 58,6%, respectivamente. A colonoscopia foi normal em 45,8% dos casos. O diagnóstico mais comum foi diverticulose (18,5%), seguido por pólipos (17%) e neoplasias (6,8%). Achados consistentes com um processo inflamatório foram identificados em 122 pacientes (12,2%) e anomalias vasculares foram detectadas em 11 pacientes (1,1%). Outros diagnósticos representaram 3,9% dos casos. Houve dois casos (0,2%) de complicações (hematoma e hemorragia submucosa), ambos após polipectomia, sem necessidade de intervenção cirúrgica. ***Conclusão*** - Os residentes sob supervisão e orientação de especialistas podem realizar colonoscopias com excelente resultado, baixo índice de complicações e com dados finais comparáveis aos obtidos por endoscopistas experientes.

DESCRITORES - Competência profissional. Endoscopia. Colonoscopia.

INTRODUCTION

The term endoscope comes from the Greek words endon (inside) and skopein (view)9. Flexible colonoscopy began with the introduction of semirigid and flexible instruments for endoscopic examination of the upper gastrointestinal tract (esophagogastroscopy). In 1954, Hopkins and Kapany described the use of a flexible fiberscope[15], but it was only in 1969 that fiberoptic colonoscopy was introduced for the examination of the terminal ileum, colon, and rectum.

Colonoscopy stands out as one of the most comprehensive screening methods for colorectal disease. This method can detect mucosal changes with higher sensitivity and specificity than contrast enema[29]. The main indications for performing endoscopic examination of the colon include evaluation of abnormalities observed on contrast examination or other imaging tests, investigation of the etiology of gastrointestinal bleeding, iron deficiency anemia, diarrhea of unknown origin, and screening and surveillance of patients with colorectal cancer or inflammatory bowel disease[1]. Common therapeutic endoscopic procedures include polypectomy, balloon dilation of stenoses, and palliative cancer care6. Adequate bowel preparation is a prerequisite for safe and good quality colonoscopy.

The main reported complications of colonoscopy are hemorrhage (usually secondary to invasive procedures), perforation, and cardiopulmonary changes associated with sedation. Other complications include explosion during colonoscopy with electrocautery, retroperitoneal abscess, pneumothorax, colonic obstruction, bacteremia, and infections.

Colonoscopic examination may be a technically difficult procedure and its effectiveness depends on variables such as the ability of the examiner, the quality of bowel preparation, and procedure-related abdominal discomfort5. The quality of a service in the treatment of colorectal cancer may be evaluated based on final results of colonoscopy, since at least 85% of the procedures are complete[23]. Studies suggest that suitably trained colonoscopists should achieve at least a 90% cecal intubation rate.

This study aimed to report the experience of one colorectal surgery service in the performance of colonoscopies done by resident physicians, outlining the epidemiological profile of patients, indications for the procedure, success of the procedure, main findings, and complication rates.

METHODS

A total of 1,000 consecutive colonoscopies done by residents were analyzed. Examinations were conducted in the endoscopy center in Brasília University Hospital, Brasília, DF, Brazil, by 4th year resident physicians under direct supervision of medical specialists, experienced in colorectal endoscopy. All residents were included in a four years residency program, focusing on general surgery during the first two years and in colorectal surgery, including endoscopic training, in the last two years. Patient demographics data, the quality of bowel preparation, indications for the procedure, procedural success, endoscopic findings, and procedure-related complications were analyzed.

Intravenous midazolam (3 to 5 mg), with or without intravenous meperidine (30 to 50 mg), was used for sedation. Colonoscopes equipped with a videocamera (Olympus® and Fujinon®) were used to explore the colon.

RESULTS

The age of the study population ranged from three to 99 years, with a mean of 53.8 years. A total of 596 (59.6%) female and 404 (40.4%) male patients were examined.

Bowel preparation was performed with 10% mannitol solution in 978 (97.8%) of patients. Other cleansing agents included lactulose and a solution containing polyethylene glycol. Colon cleansing for endoscopic examination was considered excellent by the examiner in 8.7% of cases, good in 76.3%, regular in 12.6%, and poor in 2.4%.

The main indications for performing colonoscopy examination are listed in Table 1.

TABLE 1 - Main indications for colonoscopy

Indication	%
Diagnosis	56,4
Surveillance	22,0
Screening	17,3
Therapy	9,6
Diagnostic complementation	4,3

The cecum was reached in 90.3% of cases. Intubation of the ileocecal valve was achieved in 58.6% of patients.

A normal colonoscopy was reported in 45.8% of cases. Diverticulosis was detected in 18.5% of patients, 51.4% of these patients had segmental disease and 48.6% had diffuse disease.

Polyps were identified in 17.0% and malignancies in 6.8% of patients. The main sites affected are described in Table 2.

TABLE 2 - Location of polyps and malignancies identified in 1000 colonoscopies

Location	Polyps (n = 170)	Malignancies (n = 68)
Ascendant colon	28,2%	23,3%
Transversal colon	11,1%	1,4%
Descendant colon/sigmoid	43,5%	30,8%
Rectum	21,1%	32,3%

Inflammatory changes were diagnosed in 12.2% of cases. Of these, 20.4% of patients had proctitis, 18.8% ileitis, 18.8% pancolitis, 17.2% colitis, and 14.4% proctocolitis. Other changes were found in 5% of colonoscopies, including vascular abnormalities and lipomas.

Complications were observed in two patients, both after polypectomy: one case of submucosal hematoma and one case of bleeding at the polyp pedicle. Neither of the cases required surgical intervention.

DISCUSSION

The use of colonoscopy has been well established for the diagnosis and management of colorectal diseases since its first description in the 1970s by Wolff and Shinya. Colonoscopic examination has become the method of choice for the evaluation of patients with signs and symptoms suggestive of colonic disease, being considered the most accurate test for detecting colorectal cancer[28].

Diagnostic accuracy and therapeutic safety depend on the quality of bowel preparation[26]. Inadequate preparation is associated with longer duration of the procedure[3], increased risk of unperceived changes[11], failure to complete the procedure, and other consequences in cases of procedure-related complications, such as colon perforation[14].

The ideal bowel preparation solution has yet to be defined. The cleansing agent should be able to completely remove solid and liquid fecal material, with no damage to the colonic mucosa, be easy to administer and well tolerated by patients, with no adverse effects or hydroelectrolytic disorders[26]. In Brazil, mannitol has been widely used for colon cleansing, thus being the agent of choice in most centers performing colonoscopy.

In the present study, bowel preparation was considered appropriate for colonoscopy in 97.6% of cases and insufficient in only 2.4% of the procedures. Hendry et al.[14], in a prospective study, described a rate of 16.9% of poor preparation, with a consequent increase in total costs.

Paper by Wexner[28], including 13,580 colonoscopies, diagnostic procedures accounted for 62.4% and therapeutic for 37.6% of them. The analysis of this series showed rates of 54.4% and 9.6%, respectively. It is worth noting that this study considered as a therapeutic indication only examinations in which the need for intervention had been established previously.

Colonoscopy is an operator-dependent procedure that varies with the experience of the endoscopist[23]. Cecal intubation rate can be used as a quality measure of colonoscopy[12]. A national review conducted in the United Kingdom[4] reported a 77.1% completion rate to cecum and Nahas et al.[18], assessing 2,567 colonoscopies, described a 93.95% rate. Similar results were obtained by Thomas-Gibson et al.[23] and Sieg et al.[21], who reported cecal intubation rates of 93% and 97%, respectively. Wexner[28] described a completion rate of 92%, and incomplete colonoscopy was attributed to poor bowel preparation, pain, previous abdominal or gynecological procedures, stenoses or obstructive lesions, redundancy of the colon, and extensive diverticular disease. According to Clark et al.[8], terminal ileal intubation and biopsy remain as the most reliable way to demonstrate completion of colonoscopy, and colonoscopists should therefore seek to master these skills. In this study, the cecum was reached in 90.3% of examinations and the terminal ileum in 58.6% of patients.

In the present analysis, 45.8% of examinations were normal. The most common abnormalities were diverticulosis (18.5%) and polyps (17%). Nahas et al.[18] reported a 42.4% rate of normal colonoscopy, 15.7% of polyps, and 12.8% of diverticular disease.

Only two patients had complications in this series (0.2%), with one case of submucosal hematoma and one of bleeding (0.1%) at the polyp pedicle. Bleeding and perforation are the most common complications occurring after endoscopic polypectomy, accounting for two and 0.5% of cases, respectively[29]. In 1975, Overholt[20] reviewed 15 studies, involving the removal of 3,793 polyps, and found a bleeding rate of 0.9%, perforation of 0.23%, laparotomy of 0.31%, and mortality of 0.03%. In a survey conducted by the American Society for Gastrointestinal Endoscopy[2], evaluating 25,298 colonoscopies, bleeding occurred in 0.9% and perforation in 0.2% of cases. After polypectomy (n = 6,214) these rates were 1.7 and 0.32%, respectively. Clark et al.[8] reported a bleeding rate of 0.2% and a perforation rate of 0.1%, with increased risk of bleeding when therapeutic colonoscopy was performed by inexperienced endoscopists. Wexner et al.[27] evaluated 2,069 colonoscopies and showed bleeding in 0.097% and perforation in 0.145% of cases. In another study[28], the same author reported a bleeding rate of 0.07% and a perforation rate of 0.07%, with operative treatment being required in 0.05% of cases. Habr-Gama and Waye[13] showed perforation in 0.17% and bleeding in 0.03% of patients for diagnostic colonoscopy and 0.3% and 1.4% for therapeutic colonoscopy, respectively. Vernava and Longo[24] reported bleeding in 0.2% to 3% and perforation in 0.5% to 3% of cases.

Macrae et al.[17] and Ettersperger[10] described mortality rates of 0.06 and 0.3% and Habr-Gama and Waye[13] related rates of 0.02% and 0.03% for diagnostic and therapeutic colonoscopy, respectively. Wexner et al.[27], Clark et al.[8], and Nahas et al.[18] reported a mortality rate of zero, which is consistent with results here presented. These endoscopic findings were similar to those previously reported in the literature. The colonoscopies were performed with excellent success and low complication rates.

CONCLUSION

Resident physicians under direct supervision and guidance of specialists can perform colonoscopic procedures with excellent success and low complication rates, with final results comparable to those achieved by fully trained endoscopists.

REFERENCES

1. Appropriate use of gastrointestinal endoscopy. American Society for Gastrointestinal Endoscopy. Gastrointest Endosc 2000;52:831-7.
2. Methods of granting hospital privileges to perform gastrointestinal endoscopy. American Society for Gastrointestinal Endoscopy Standards of Training and Practice Committee. Gastrointest Endosc 1992;38:765-7.
3. Bernstein C, Thorn M, Monsees K, Spell R, O'Connor JB. A prospective study of factors that determine cecal intubation time at colonoscopy. Gastrointest Endosc 2005;61:72-5.
4. Bowels C, Leicester R, Swabrick E, Williams C, Romaya C, Epstein O. Intercollegiate B.S.G National Colonoscopy (IBNC) Audit: methods used to identify the caecum and caecal intubation rate [abstract]. Gut 2001;48:A10.
5. Bowles CJ, Leicester R, Romaya C, Swarbrick E, Williams CB, Epstein O. A prospective study of colonoscopy practice in the UK today: are we adequately prepared for national colorectal cancer screening tomorrow? Gut 2004;53:277-83.
6. Cataldo PA. Colonoscopy without sedation. Dis Colon Rectum 1996;39:257-61.
7. Chokhavatia S, Nguyen L, Williams R, Kao J, Heavner JE. Sedation and analgesia for gastrointestinal endoscopy. Am J Gastroenterol 1993;88:393-6.
8. Clark SK, Rocker MD, Reddy KP, Aslam M, Owen ER. Confirmation of complete colonoscopy without intubation of the ileum. . Colorectal Dis 1999;1:283-5.
9. Corman ML. Colon and rectal surgery. Philadelphia: Lippincott Williams & Wilkins; 2004.
10. Ettersperger L, Zeitoun P, Thiefin G. [Colonic perforations complicating colonoscopy. Apropos of 15 consecutive cases observed over 16 years]. Gastroenterol Clin Biol 1995;19:1018-22.
11. Froehlich F, Wietlisbach V, Gonvers JJ, Burnand B, Vader JP. Impact of colonic cleansing on quality and diagnostic yield of colonoscopy: the European Panel of Appropriateness of Gastrointestinal Endoscopy European multicenter study. Gastrointest Endosc 2005;61:378-84.
12. Gorard DA, McIntyre AS. Completion rate to caecum as a quality measure of colonoscopy in a district general hospital. Colorectal Dis 2004;6:243-9.
13. Habr-Gama A, Waye JD. Complications and hazards of gastrointestinal endoscopy. World J Surg 1989;13:193-201.
14. Hendry PO, Jenkins JT, Diament RH. The impact of poor bowel preparation on colonoscopy: a prospective single centre study of 10,571 colonoscopies. Colorectal Dis 2007;9:745-8.
15. Hopkins HH, Kapany NS. A flexible fibrescope, using static scanning. Nature 1954;173:39-41.
16. Lindsay DC, Freeman JG, Cobden I, Record CO. Should colonoscopy be the first investigation for colonic disease? Br Med J (Clin Res Ed) 1988;296:167-9.
17. Macrae FA, Tan KG, Williams CB. Towards safer colonoscopy: a report on the complications of 5000 diagnostic or therapeutic colonoscopies. Gut 1983;24:376-83.
18. Nahas SC, Marques CF, Araujo SA, et al. [Colonoscopy as a diagnostic and therapeutic method of the large bowel diseases: analysis of 2,567 exams]. Arq Gastroenterol 2005;42:77-82.
19. NHSE. Guidance on Commissioning Cancer Services 'Improving Outcomes in Colorectal Cancer'. London: HMSO; 1997.
20. Overholt BF. Colonoscopy. A review. Gastroenterology 1975;68:1308-20.
21. Sieg A, Hachmoeller-Eisenbach U, Eisenbach T. Prospective evaluation of complications in outpatient GI endoscopy: a survey among German gastroenterologists. Gastrointest Endosc 2001;53:620-7.
22. Tan JJ, Tjandra JJ. Which is the optimal bowel preparation for colonoscopy - a meta-analysis. Colorectal Dis 2006;8:247-58.
23. Thomas-Gibson S, Thapar C, Shah SG, Saunders BP. Colonoscopy at a combined district general hospital and specialist endoscopy unit: lessons from 505 consecutive examinations. J R Soc Med 2002;95:194-7.
24. Vernava AM, 3rd, Longo WE. Complications of endoscopic polypectomy. Surg Oncol Clin N Am 1996;5:663-73.
25. Waye JD, Kahn O, Auerbach ME. Complications of colonoscopy and flexible sigmoidoscopy. Gastrointest Endosc Clin N Am 1996;6:343-77.
26. Wexner SD, Beck DE, Baron TH, et al. A consensus document on bowel preparation before colonoscopy: prepared by a task force from the American Society of Colon and Rectal Surgeons (ASCRS), the American Society for Gastrointestinal Endoscopy (ASGE), and the Society of American Gastrointestinal and Endoscopic Surgeons (SAGES). Surg Endosc 2006;20:1147-60.
27. Wexner SD, Forde KA, Sellers G, et al. How well can surgeons perform colonoscopy? Surg Endosc 1998;12:1410-4.
28. Wexner SD, Garbus JE, Singh JJ. A prospective analysis of 13,580 colonoscopies. Reevaluation of credentialing guidelines. Surg Endosc 2001;15:251-61.
29. Winawer SJ, Stewart ET, Zauber AG, et al. A comparison of colonoscopy and double-contrast barium enema for surveillance after polypectomy. National Polyp Study Work Group. N Engl J Med 2000;342:1766-72.