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ORIGINAL ARTICLE

Efficacy and complications in the use of self-expanding colonic stents: An analysis of 15 years' experience☆

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KEYWORDS
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Abstract
Objective: To analyze the efficacy and safety of the procedure for placing self-expanding stents in the colon. To evaluate the factors associated with complications. To analyze the dose of radiation delivered in the procedure.
Material and methods: This was a retrospective descriptive study of 478 procedures done at a single center to place self-expanding metallic stents in the colon. A total of 423 nitinol stents and 79 stainless steel stents were placed. We included all colonic obstructions, of which 446 had malignant causes and 8 had benign causes. We excluded patients with intestinal perforation, severe colonic bleeding, short life expectancy, or lesions located less than 5 cm from the anus. We collected the dosimetric data and analyzed the technical success, clinical success, and complications during follow-up.
Results: The procedure was a technical success in 92.26% of cases (n = 441) and a clinical success in 78.45% (n = 375); complications occurred during follow-up in 18.5% of cases. Complications occurred more frequently with the stainless steel stents than with the nitinol stents (OR: 3.2; 95% CI: 1.8–5.7). The mean value of the dose area product was 35 Gy cm^2. When instead of being done by the interventional radiologist working together with an endoscopist the procedure was done exclusively by the interventional radiologist, the time under fluoroscopy ($p = 0.001$), dose area product ($p = 0.029$), and kinetic energy released per unit mass ($p = 0.001$) were greater.
Conclusion: The procedure for placing self-expanding colonic stents is efficacious and safe with an acceptable rate of complications. The doses of radiation delivered were low, and the radiation doses and time under fluoroscopy were lower when the procedure was done together with an endoscopist.

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PALABRAS CLAVE
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Eficacia y complicaciones en el empleo de prótesis autoexpandibles de colon: análisis de un periodo de 15 años

Resumen
Objetivo: Analizar la eficacia y seguridad del procedimiento para colocar las prótesis autoexpandibles de colon. Evaluar los factores asociados a complicaciones. Realizar un análisis dosimétrico del procedimiento.
Material y métodos: Realizamos un estudio descriptivo retrospectivo unicéntrico de 478 procedimientos para colocar prótesis metálicas autoexpandibles de colon. Se insertaron 423 prótesis de nitinol y 79 de acero inoxidable. Incluimos todas las obstrucciones de colon, 446 de etiología maligna y 8 de causa benigna. Excluimos los pacientes con perforación intestinal, hemorragia grave del colon, esperanza de vida corta y lesiones situadas a menos de 5 cm del ano. Analizamos el éxito técnico, éxito clínico, las complicaciones durante el seguimiento y recogimos los datos dosimétricos.
Resultados: Se obtuvo éxito técnico en un 92,26% (n = 441), éxito clínico en un 78,45% (n = 375) y un porcentaje de complicaciones durante el seguimiento del 18,5%. Las prótesis de acero tuvieron más complicaciones (OR: 3,2; IC 95%: 1,8-5,7). El valor medio de producto dosis por área fue 35 Gy.cm^2. El de tiempo de fluoroscopia (p = 0,001), producto dosis por área (p = 0,029) y kerma (p = 0,001) fueron mayores si el procedimiento fue realizado exclusivamente por fluoroscopia, en vez de conjuntamente por el endoscopista y el radiólogo intervencionista.
Conclusión: El procedimiento para colocar prótesis autoexpandibles de colon es eficaz y seguro, con una tasa aceptable de complicaciones. Las dosis de radiación fueron bajas, con menos dosis y tiempos de fluoroscopia cuando el procedimiento se realizó de manera conjunta con el endoscopista.

Introduction

Colorectal carcinoma is the most frequent neoplasm in patients >75 years old[1] and the third most frequent tumor in men and women. Almost 60% of the cases are diagnosed in developed countries.[2,3] Different environmental factors can promote its development and contribute to the high incidence of this tumor in today's society.[4–7] In Spain, it is responsible for 10% of all malignant tumor deaths reported in 2007.[8] In our health area its incidence is in a sort of mid-high range of the estimated for Spain–both for men and women and it is one of the highest if we take into consideration the carcinoma of rectal location exclusively.[9]

Up to 30% of the patients suffering from a colorectal carcinoma will have a partial or complete intestinal obstruction during diagnosis,[10] more frequently in the left hemicolon.[11] The definitive treatment for the obstruction is surgical. However, implanting self-expanding colonic stents where the stenosis is located allows us to solve the acute phase and plan a staged intervention with better patient preparation thus improving morbidity and mortality.[12] Some studies indicate that this strategy is beneficial even when it comes to cost.[13,14] In cases of unresectable tumor or inoperable patient the stent can be delivered as palliative treatment. Several publications describe it as an effective beneficial intervention for paients[15] with a similar surgical prognosis yet avoiding the colostomy while improving the quality of life of the patient.[16–18]

The goal of this study is to analyze the effectiveness and safety of the procedure of deploying self-expanding colonic stents and the differences base on the location of the tumor, the evolution of the procedure through the years in an effort to study the factors associated with the complications and conduct a dosimetric analysis of the procedure.

Materials and methods

Patients

We studied retrospectively all the procedures for placing self-expanding metallic colonic stents in our hospital from January 1996 to May 2012. All the total and partial malignant obstructions of the colon were included and in some cases those of benign causes non-eligible for emergency surgery. Patients with intestinal perforation, serious hemorrhage of the colon, short life expectancy and lesions located less than 5 cm away from the anal margin were precluded. We reviewed the records of the interventions filed in the Vascular and Interventionist Radiology Department and the patient's medical history to obtain information about the clinical and technical success, control X-rays, the diagnostic tests conducted, the complications occurring during the follow-up and other variables of interest. The files from our hospital Department of the Radiophysics were used to obtain the dose of radiation used. The signed written informed consent was obtained from all patients before the procedure and our hospital Ethical Committee for Clinical Research approved this study and its publication.