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Results of EVAR followed by colectomy

Ann. Ital. Chir., 2013 84: 579-582
Published online 5 November 2012
pii: S0003469X1202060X
www.annitalchir.com

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Colorectal cancer associated with abdominal aortic aneurysm. Results of EVAR followed by colectomy

The association of colorectal cancer and abdominal aortic aneurysm (AAA) is infrequent but poses special problems of priority of treatment under elective circumstances. The purpose of this study was to retrospectively evaluate the outcome of 16 consecutive patients undergoing endovascular aneurysm repair (EVAR) followed by colectomy. Operative mortality was nil. Operative morbidity included two transient rise of serum creatinine level and one extraperitoneal anastomotic leakage which evolved favourably with conservative treatment. EVAR allowed a very short delay of treatment of colorectal cancer after aneurysm repair, minimizing operative complications.

KEY WORDS: Abdominal aortic aneurysm, Colorectal cancer, EVAR.

Introduction

The association of colorectal cancer and abdominal aortic aneurysm (AAA) is rare, with an estimated incidence of 0.5% [1]. Beside urgent cases in which the symptomatic condition is treated first, this association may pose special problems of priority of treatment on an elective basis. The most frequent case is the detection of an asymptomatic AAA during the preoperative workup of a patient with colorectal cancer scheduled to undergo an elective colectomy [2]. Before endovascular aneurysm repair (EVAR) became available, which of the two conditions was to be treated first, with particular consideration of the risk of contamination and sepsis of the aortic graft, were a matter of debate [3,4]. The advent of EVAR, significantly shortening the delay between aneurysm repair and colectomy, changed the former paradigm of treatment [5-7].

The purpose of this study was to evaluate the results of a consecutive series of patients with colorectal cancer and AAA > 5 cm in diameter undergoing EVAR followed by colectomy.

Material and methods

From January 2001 to December 2011, 16 patients were admitted for the elective treatment of colorectal cancer and an associated, asymptomatic AAA > 5cm. The patients' mean age was 67 years (range 48 – 81), and 10 of them were men. The aneurysm was detected at a CT scan performed during the standard preoperative workup of colorectal cancer. EVAR was performed under general anesthesia in 9 cases and peridural anesthesia in 7, and always through a common femoral artery cut-

Pervenuto in Redazione Settembre 2012. Accettato per la pubblicazione Ottbre 2012
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Fig. 1: Endovascular repair of an infrarenal aortic aneurysm associated with a left colon cancer. The control angiography shows a correctly positioned aorto-biiliac graft, with a commple exclusion of the aneurysm and no apparent endoleak.

down. All the repairs were performed with aorto-biiliac stent grafts (Fig. 1), with the addition of an hypogastric artery side branch device in one. Three patients with rectal cancer underwent neo–adjuvant radiation therapy after aneurysm repair, and were operated of colectomy, after, respectively, 32, 48 and 55 days. The mean delay between EVAR and colectomy for the other 13 patients was of 12 days.

The surgical treatment of colorectal cancer consisted of a sigmoidectomy in 6 cases, right colectomy in 4, left colectomy in 3, and anterior rectal-colon resection in 3. After anterior rectal-colon resection a protection ileostomy was performed and drains were exteriorized through the elevator muscles and the perineum. No protection stoma was performed and drains were exteriorized through the flank in all the other cases. The primary endpoint of the study was operative mortality and procedure related complications in the postoperative period. Operative mortality was defined as any death occurring within 30 days from both the surgical procedures or during the whole length of hospitalization. Operative morbidity was defined as any postoperative complication requiring either reoperation or prolonging postoperative hospitalization beyond 10 days after each procedure. Renal failure was defined as any rise of serum creatinine requiring dialysis in the postoperative period. Renal insufficiency was defined as any rise of serum creatinine above 150 mmol/l, persisting by the time of patient's discharge.

Table I - *Timing*

N	EVAR + Neoadjiuvant therapy	Mean delay (days)
3	Yes	45
13	No	12

Table II - *Technical details*

EVAR	N
Aorto-biiliac stent grafts	16
Aorto-biiliac stent graft + IBD	1
Common femoral artery cutdown	16
General anesthesia	9
Peridural anesthesia	7
Surgical treatment of colorectal cancer	N
Sigmoidectomy	6
Right colectomy	4
Left colectomy	3
Anterior rectal-colon resection	3
Protection ileostomy	3

Table III - *Primary details*

Primary end-point	N
Operative Mortality	0
Operative Morbidity	2 Transient rise of serum creatinine 1 Colorectal anastomosis leakage

Results

Operative mortality was nil after each procedure. Two patients presented a transient rise of serum creatinine at 160 and 170 mmol/l after EVAR, which regressed within 48-72 hours with appropriate fluid infusion. No complication related to the graft or at the site of femoral artery cutdown was observed. All the endografts were well patent, well positioned and the aneurysms correctly excluded at a control CT-scan performed between 2 to 7 days after the endovascular procedure. One patient undergoing anterior rectal-colon resection presented a minor, extraperitoneal anastomotic leakage that healed without requiring reoperation, but prolonging postoperative stay in the hospital.

Discussion

For several years, especially before the advent of EVAR, the best strategy of timing the treatment of concomitant AAA and colorectal cancer, was a matter of debate.

In urgent settings, the one of the two becoming symptomatic would be treated first [2]. The issue of elective treatment is essentially which disease should be treated first and which would be the safe delay for the treatment of the other one. Performing the colecctomy first may expose to the risk of aneurysmal rupture, especially for those AAA of diameter > 6 cm, and to the risk of potential graft infection if residual, asymptomatic microabscesses persist after colectomy. For this reason the optimal delay for open AAA repair after colectomy has been estimated to be approximately of 3 months. Such delay, however, may be unacceptable when dealing with large AAA. On the other hand, performing AAA repair first may delay a timely oncologic therapy, enhancing the risk of accelerated tumor progression and metastases [8]. A few series exist of synchronous, open treatment of both conditions or of AAA with unforeseen other abdominal diseases, with overall good results [9-13]. However, the risks of arterial graft contamination and sepsis during synchronous open procedures remains too high for this strategy to be widely accepted. EVAR, when anatomically feasible, has brought a significant improvement in the treatment strategy of AAA and colorectal cancer, allowing AAA to be treated first followed by colectomy within a delay that rarely exceeds two weeks, often during the same hospitalization [5-8]. One further advantage of EVAR first is that it allows safe performance of neo adjuvant radiation therapy for downstaging of rectal cancers, whereas, formerly, oncologists were fairly reluctant to perform neo-adjuvant treatments with an unrepaired AAA, for the fear of precipitating aneurysmal rupture. If an adequate interventional suite is available, theorically, EVAR and colectomy could be performed synchronously, thus treating both the conditions simultaneously profiting of the same anesthesia. However this aggressive strategy may not be appropriate, for the risk that the endograft may become infected, when not yet fully incorporated, due to the bacteremia related to colonic resection [8]. This statement is supported by the fact that a few days delay between EVAR and colectomy will have no impact on the oncologic status of the patient. One important issue concerning EVAR in the setting of colorectal cancer is the covering of the inferior mesenteric artery (IMA). This unavoidable consequence of the endovascular procedure determines a potential reduced perfusion of the rectum and the sigmoid, which may become significant at the time of a right colectomy for the interruption of the Drummond's arcade. For this reason it is very important that both the hypogastric arteries are spared at the time of EVAR, eventually inserting an iliac side branch device, when needed during the endovascular procedure, to preserve the flow in the hypogastric artery [14]. EVAR can still be proposed [15], but may not be always feasible, due to anatomical reasons, including short aneurysmal neck, tortuous arteries, associated ilio-femoral stenoses or obstructions. In these open aneurismal repair should be considered, eventually via left flank exposure [16,17], establishing the priority of which condition be treated first on an individual patient's basis, according to the diameter of the AAA, its risk of rupture, and the oncologic status of colorectal disease.

In conclusion EVAR allows a significant advance in the strategy of treatment of two associated conditions as AAA and colorectal cancer, significantly shortening the delay between the vascular and colorectal procedure, with an excellent postoperative outcome.

Riassunto

L'associazione cancro colo-rettale – aneurisma dell'aorta addominale è poco frequente, ma pone particolari difficoltà sulla priorità del trattamento in elezione. Lo scopo di questo studio è di valutare i risultati del trattamento in 16 pazienti consecutivi sottoposti al trattamento endovascolare dell'aneurisma seguita da una resezione del colon. Nessun paziente è deceduto nel postoperatorio. Non si è osservato alcun decesso post-operatorio. La morbilità postoperatoria è consistita in due rialzi transitori della creatininemia e una fistola anastomotica trattata conservativamente. Il trattamento endovascolare ha permesso l'esecuzione della colectomia a una distanza molto breve dall'esclusione dell'aneurisma, riducendo al minimo le complicanze postoperatorie.

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