Abdominal aortic aneurysm and concomitant malignancy: What treatment?



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Abdominal aortic aneurysm and concomitant malignancy: What treatment?

The association of neoplasm and abdominal aortic aneurysm (AAA), although rare, may represents a therapeutic dilemma.

MATERIALS AND METHODS: Between January 1990 and December 2004 in our departement 127 patients were submitted because of an AAA, in 8 cases there was an association with a neoplasm, in the greater part being a colon cancer. In 3 cases we performed a one stage surgery, in 1 case the chose was for a two stage surgery, for 3 patients we opted for an endovascular treatment by an endograft, in 1 case a pancreatic cancer was diagnosed 3 months after the prosthetic replacement of an AAA and there were no surgical indications because of the patient was in an advanced neoplastic stage.

RESULTS: There weren't any prosthetic infection or more serious complications. The endovascular treatments were performed successfully without complications after few days being followed by cancer's resection.

DISCUSSION: In case of this association the prognosis is related to neoplasm's stage. Timing depednds on the pathology that has the higher risk of short-term complication. Since Nineties author's reports in Literature about one stage surgery are more frequent, while now endovascular methods open new chances.

CONCLUSIONS: one stage surgery is a safe option in case of association between AAA and cancer. We think that a good porpouse is the use of a vascular endograft in aneurysmal treatment followed, after few days, by cancer's resection.

KEY WORDS: Abdominal aortic aneurysm, Endovascular treatment, Gastrointestinal malignancy, One stage surgery.

Introduction

Both abdominal aortic aneurysm (AAA) and malignancy are life-threatening diseases frequently encountered in the elderly.

Currently the 2,5% of population over 60 is believed to be carrier of AAA ¹, the association with a gastrointestinal malignancy has been observed with a variable incidence. Colonic and gastric localizations have the greatest incidence in literature.

In case of co-existence of neoplasm and AAA, the surgeon must decide whether to delay the resection of a pathology after the resolution of the more urgent one (two stage surgery) or whether to perform concurrent resection in a synchronous approach (one stage surgery). Till the past decade, the greater part of literary reports seems to be favourable for a treatment in two times. This imposes a choice about the pathology to treat first and about the time that has to pass between the two operations. Both options are not clearly codified by different authors, giving large freedom to single surgeon. From the Nineties, experiences of one stage treatment for association between AAA and neoplastic disease are less sporadic.

Materials and methods

Between January 1990 and December 2004 in our Department of Surgery, 693 patients were submitted for arterial vascular surgery (552 males and 141 females). The AAA were 127 (114 males and 13 females) with median age of 64 year and a range between 58-74 years. The co-existence of AAA and cancer was present in 8 cases with an incidence of 6,3% in our records.

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5 neoplasms were located in the colon, each one of the other was in the rectum, in the right lung and in the pancreas.

Of the 6 large bowel cancer 3 were located in the sigmoid colon, 2 in the right colon and 1 in the rectum. An adenocarcinoma affected the right lung. A pancreatic neoplasm was diagnosed four months after the surgical treatment of an AAA.

All the AAAs were of the infrarenal type, were more than 5 centimeters (cm) in diameter ranging from 5 to 6,8 cm. In two cases of concomitance between AAA and colon cancer the diagnosis has been made as casual report through CT abdominal scan made for AAA study, and followed by endoscopic confirmation. The other patients were hospitalised for cancer's treatment and the aneurysm has been diagnosed by chance during its stadiation. All patients were electively hospitalised and they were easily submitted to preoperative preparation associated with a suitable antibiotic prophylaxis. In the first 3 cases of concomitance between AAA and colonic neoplasm the treatment was a one stage surgery through a midline trans peritoneal approach. The classic resection of the aneurysm with implantation of a bifurcated tube graft was followed by a careful closure of retro peritoneum and by the execution of the 2 left colectomy and 1 right colectomy. In one patient affected by multiple hepatic metastasis from a right colon cancer, we have opted only for a palliative colonic resection, thinking that survival was linked to neoplasm's progression because the AAA didn't give signs of very near breaking. After nearly 3 months we have suspected the possible breaking of AAA, because of abdominal aches irradiated to back, and we have opted for an endovascular treatment using an endograft.

In the patient with AAA and lung cancer we performed before a thoracotomy with a right superior lobectomy and, after 3 weeks, the aneurysm was treated by the application of a bifurcated tube graft. In this case therapeutic decision was made in relation to aneurysm's dimension, with particular attention to its transversal diameter, that is considered critic when it's more than 5 cm, and in relation to the presence of mural thrombus not correlating with an impending rupture of the aneurysm itself. When we observed the patient with pancreatic cancer he was affected by jundice in an advanced neoplastic stage and we chosed an endoscopic palliation by a wall stent. The last two patients affected by AAA and colon cancer, located in the sigmoid colon and in the rectum were subjected to endovascular grafts placing and, after 3 days was performed the colonic resection.

Results

The 4 AAAs surgically treated were each resected and replaced with a woven Dacron graft of bifurcated type. There were no operative deaths or severe post operative complication. The median hospital stays was of 13 days with range 11-18 days.

In only one case we chosed the two stage surgery. We didn't find any vascular prosthesis infections or other more serious complications related to one stage surgery. There were no temporary ileo or colostomies when the tumor was located in the colon. The resected colon cancer were staged according to Dukes stadiation in stage C (3 cases), B2 (2 cases) and 1 was a D stage.

The pancreatic cancer probably was a diagnostic mistake, infact the neoplasm had to be already present during the first operation, but it escaped both to CT enquiry and to surgical exploration. In this case we can suppose that anesthesiologic procedures and surgical maneuvers increased neoplastic progression, contributing to lower immune defences. The patient died of neoplastic progression 3 months after ours observation.

Since the second semester of 1999 the endovascular grafts are regularly used in our department. We think that when their use is anatomically possible and clinically suitable, this procedure enables a more secure and successful treatment of association of AAA and neoplastic pathology, giving priority to AAA treatment and after some days to neoplasm. Endovascular exclusion was successfully performed in all 3 patients under local anesthesia, there were no surgical conversion and there were no evidence of endoleak.

Follow up was related to cancer stadiation and consisted of periodical CT scans for monitoring the vascular pathology.

The patient with lung cancer died after 28 months for neoplastic progression, two patients with colon cancer died of acute heart failure, the other patients are alive, two of this actually in follow up.

Discussion

In case of association between AAA and neoplasm Komori demonstrated that the survival rate after one year from the treatment of both lesions is higher (81%) than that of the patients who underwent the resolution of only one pathology $(17\%)^{-2}$.

The prognosis is related to neoplasm's origin, to its state and to surgical treatment, radical or palliative, that was performed.

A neoplasm with an high biological aggressivity and a fatal short-term prognosis (for example cholangiocarcinoma or head pancreatic cancer), or the preoperatory evidence of a palliative resection controindicates the excision of the aneurysm that is performed only when it is breaking, being the survival not related to its treatment ³.

The choice of a two stage surgical approach is linked to the fear of vascular prosthesis infection that occurs in near 1.3% of aneurysms electively treated, being burdened by a death-rate higher than 77% ⁴.

The timing of two stage's treatment depends on the pathology that has the higher risk of short-term complication. The resolution of the aneurysm is a priority in association with signs of cleavage or breaking, indeed, if the neoplasm is stenotic or bleeding must be resected first.

Some authors report a higher impact of aneurismal breaking following a laparotomia ^{5.} It's ascribed to various manoeuvres of dissection that can damage aneurysm's wall ⁶. More probably the breaking is due to the decrease of mural collagen concentration caused by the increased activity of wall collagenasi, above all it happens in the first week after surgery representing a risk factor for arterial wall integrity ^{7,8}.

Japanese authors ⁹ in 1992 proposed wrapping that consists in covering aneurysmatic wall with a polipropilene prosthesis to create a protective barrier that can avoid, or at least delay, aneurysmatic breaking in the immediate postoperatory period. However this proposal doesn't seem having a large success.

Treatment of vascular pathology firstly can contribute to neoplasm's spread considering catabolic and immunodepressive effects following surgery and general anaesthesia. In case of two stage surgery the time between the operations is not coded in Literature and, if the neoplasm is treated before, is more difficult the preparation of the abdominal aorta also using an extraperitoneal access.

Since Nineties author's reports in Literature about one stage surgery are always more frequent. Matsumoto preferred two stage surgery, reserving one stage only for gastric resection and abdominoperineal rectal resection (Miles) using two isolated accesses. Himself from April 1997 converted to one stage surgery through a transperitoneal approach. However in case of colon cancer, he suggestes to perform a colostomy in order to reduce the effect of a possible anastomotic leakage ¹⁰.

In the case of colon resection, some authors ¹¹ state that intraperitoneal septic microemboli can remain till to 6 weeks after surgical's procedure. For this reason colonic intraoperative lavage isn't recommended. The presence of septic peri-anastomotic localizations must be excluded by CT scan before setting up the prosthesis.

The abdominoperineal resection is considered beeing a low risk of infection, lacking of intraperitoneal anastomosis. For this reason a lot of authors agree to use one stage surgery treating before the aneurysm and then the rectal cancer ¹².

In case of gastric cancer the tendency is for a one stage treatment because of the relatively aseptic content of the stomach. Gastric resection is thought to have lower risk than total gastrectomia, because the last needs of two intestinal anastomosis ¹³.

In case of a retroperitoneal neoplasm (for example kidney cancer or a retropetitoneal sarcoma) one stage surgery is suitable, in fact aneurysm and tumour are already in contact, and the infective risk is like a common intervention of abdominal vascular surgery using a prosthesis ¹⁴.

One stage surgery's advantages are essentially the use of a single anaesthesia and a unique postoperatory period, reducing hospital stay, with economical advantages.

Aortic grafting is usually performed first and neoplasm resection is carried on after peritoneal coverage and isolation of the prosthetic graft ¹⁵.

Some authors propose one stage surgery in case of colon cancer with an extra-anatomical bypass to reduce risk's infection. However the ligature of the aneurysmatic neck's doesn't eliminate totally septic risks, increasing greatly surgical time and making a residual unstable arterialization of internal iliac arteries ¹⁶, increasing risk of ischaemia of the residual colon after a low resection ¹⁷, about all if associated to neo-adjuvant radiotherapy ¹⁸. In case of association of AAA and pulmonary neoplasm, although one stage surgery is reported in literature, we think that's better a two stage treatment; in fact the association of a laparotomy and a thoracotomy often imply a damage of breathing functions, about all in old patients often affected by respiratory and cardiological co-morbidity ¹⁹.

Endovascular methods open new chances, although without a follow up of long term ²⁰. In fact the indication of aortic endograft placing allows a mini invasive resolution of aneurysmatic pathology; after few days, laparotomic intervention can be performed without additional risk's infection ^{21,22}.

The AAA treatment with endografts, every time it is feasible ²³, is nowadays the better procedure when there is also the presence of a neoplasm, above all of the gastroenteric tract, although there isn't conclusive data in literature. The endovascular procedure must be performed before neoplasm's treatment that will be done after some days ²⁴.

In last years reports about the use of colonic endoprosthesis are always more frequent, these are placed endoscopycally in stenotic or substenotic colon cancer differing surgical treatment and decreasing the risks due to emergency surgery ^{25,26}; this procedure may be considered in case of association of AAA and stenotic colon cancer so both lesions would be undergone a one stage surgery with economical advantages justifing the use of colonic endoprosthesis.

Conclusions

In case of association of AAA and neoplasm the problem of timing has been discussed longly without any univocal conclusions, above all in case of association between colon cancer and AAA considering the higher risk of prosthesis's infection.

The survival is drastically reduced in patients affected by an advanced cancer, so in this case the greater diagnostic effort must be concerned preoperatory to stadiate the neoplasm, in fact surgical oncology influences more heavily life's expectation.

However according to literature's data and to our experience, we think that one stage surgery is clearly reasonable if done with the necessary surgical accuracy. Actually endovascular stent graft diffusion for AAA treatment gives a more choice, eliminating a lot of past diatribes, allowing us to treat AAA and reducing greatly surgical's trauma and risks of infection linked to traditional surgery. So we think that nowadays the better choice is aneurysmal treatment with endoprosthesis every time it is possible, followed after few days, by neoplasm's resection.

Riassunto

L'associazione fra patologia neoplastica ed aneurisma dell'aorta addominale (AAA) impone delle scelte terapeutiche.

MATERIALI E METODI: Fra gennaio 1990 e dicembre 2004 presso la nostra divisione di chirurgia sono stati trattati 127 pazienti affetti da AAA, in 8 casi concomitava una neoplasia che nella maggior parte dei casi era localizzata al colon. In 3 casi abbiamo optato per il trattamento simultaneo, in 1 caso è stato eseguito il trattamento in due tempi, 3 pazienti sono stati sottoposti a trattamento endoprotesico dell'aneurisma e, successivamente alla resezione della neoplasia; in un paziente affetto da neoplasia cefalopancreatica in stadio avanzato e diagnosticata 3 mesi dopo il trattamento chirurgico dell'aneurisma, non sussistevano piu' indicazioni chirurgiche.

RISULTATI: non abbiamo riscontrato infezioni proteiche o complicanze maggiori, il trattamento endovascolare è stato eseguito con successo, seguito, dopo alcuni giorni, dalla resezione della neoplasia.

DISCUSSIONE: In caso di concomitanza fra le due patologie la prognosi è determinata dallo stadio della neoplasia; il timing dipende dalla patologia a maggior rischio di complicanze a breve termine. A partire dagli anni '90 reports letterari di trattamento simultaneo sono piu' frequenti mentre attualmente il trattamento endovascolare ci offre nuove opzioni terapeutiche.

CONCLUSIONI: Il trattamento simultaneo è proponibile e sicuro. Riteniamo che attualmente la miglior opzione sia il trattamento endoprotesico dell'aneurisma seguito, dopo alcuni giorni, dalla resezione della neoplasia.

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