Management of Co-existing Intra-abdominal Disease in Aortic Surgery


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**Objectives:** The treatment of abdominal aortic aneurysms more than 5 cm in diameter is well accepted, but controversy surrounds the management of concomitant serious intra-abdominal lesions diagnosed in the perioperative period. This study was undertaken to demonstrate that synchronous surgery is feasible and safe in this group of patients.

**Design:** In 1978 a decision was made to undertake combined operations on all patients with an aortic aneurysm of 5 cm or more in diameter and a significant non-vascular intra-abdominal lesion requiring surgery.

**Methods:** The case records of 676 patients who had aortic grafting for aneurysmal disease or the urgent management of occlusive disease between 1978 and 1998 were analysed retrospectively.

**Setting:** District general hospital.

**Results:** Fifty-six (8%) patients had co-existing intra-abdominal disease treated at the time of aortic graft surgery. There were three (5%) hospital deaths and seven patients required early reoperation. One patient developed a subphrenic abscess and there were three superficial wound infections. There has been no clinical evidence of aortic graft infection in this series.

**Conclusion:** This single centre experience with synchronous surgery demonstrates that it is safe and does not appear to predispose to an increased risk of graft infection.

**Key Words:** Aortic aneurysm; Co-existing abdominal disease; Synchronous surgery.

**Introduction**

The presence of co-existing intra-abdominal disease at the time of abdominal aortic surgery represents a therapeutic dilemma for the vascular surgeon. It is reported that between 3.4% and 12% of patients having aortic graft surgery have an associated abdominal condition that requires surgery.1-3 Although there have been several papers reviewing management options,4-6 even the most recent review7 has fought shy of a definitive opinion as to whether both lesions should be treated simultaneously or as staged procedures. The theoretical increased risk of graft infection, despite little evidence in literature, remains the main argument against synchronous surgery.

Twenty years ago this unit elected to treat any co-existing intra-abdominal disease synchronously with aortic graft surgery. This was on the premise that the benefits of a single operation, often in very elderly patients, would outweigh the potential risk of graft infection and increased complication rates from prolonged operations. In the cases with carcinoma it would avoid the potential for spread if resection of the carcinoma was the delayed procedure. In 1992 an initial report of the outcome of 32 operations was published and this experience has now been extended to 56 cases.8 This paper reports the outcome of the extended series from the same surgical unit where the procedures were carried out by three consultants and their surgical trainees.

**Patients and Methods**

A retrospective study was carried out of the medical records of all patients who had undergone combined grafting and gastrointestinal surgery between August 1978 and July 1998. There were 22 women and 44 men and their age ranged between 46 and 90 (median 72) years. Aortic grafting was considered indicated in patients presenting with a significant aortic aneurysm (5 cm or greater in diameter) or aortoiliac disease requiring urgent surgery for critical ischaemia. The non-vascular pathology was diagnosed either in the preoperative period or discovered at the time of surgery.

It has been the unit’s practice to perform aortic...
Table 1. Co-existing intra-abdominal disease treated at the same time as aortic grafting in this series.

<table>
<thead>
<tr>
<th>Disease</th>
<th>Procedure</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gallbladder disease</td>
<td>Cholecystectomy</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td>Cholecystectomy &amp; CBDE</td>
<td>2</td>
</tr>
<tr>
<td>Haemangioma</td>
<td>Partial heparctomy</td>
<td>1</td>
</tr>
<tr>
<td>Duodenal ulcer</td>
<td>Vagotomy &amp; pyloroplasty</td>
<td>10</td>
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<tr>
<td>Gastric ulcer</td>
<td>Excision of ulcer</td>
<td>1</td>
</tr>
<tr>
<td>Gastric carcinoma</td>
<td>Gastrectomy</td>
<td>2</td>
</tr>
<tr>
<td>Colonic carcinoma</td>
<td>Right hemicolecotomy</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Anterior resection</td>
<td>1</td>
</tr>
<tr>
<td>Diverticulitis</td>
<td>Sigmoid colectomy</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Right hemicolecotomy</td>
<td>1</td>
</tr>
<tr>
<td>Sigmoid volvulus</td>
<td>Hartmann’s</td>
<td>1</td>
</tr>
<tr>
<td>Colonic infarction</td>
<td>Hartmann’s</td>
<td>2</td>
</tr>
<tr>
<td>Appendicitis</td>
<td>Subtotal colectomy</td>
<td>1</td>
</tr>
<tr>
<td>Jejunal diverticulitis</td>
<td>Appendectomy</td>
<td>2</td>
</tr>
<tr>
<td>Bladder carcinoma</td>
<td>Total cystectomy</td>
<td>1</td>
</tr>
<tr>
<td>Renal carcinoma</td>
<td>Nephrectomy</td>
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</table>

CBDE = Common bile duct exploration.

graft surgery via a transperitoneal approach and no consideration was given to an extraperitoneal approach, even when the non-vascular procedure was diagnosed in the preoperative period. With the exception of the two patients who had total gastrectomies, aortic grafting was performed first and the peritoneum closed over the prosthesis, before proceeding with the completion of the second procedure. 5,000 units of heparin was given to all patients prior to aortic cross-clamping, and the effect was not reversed with protamine. All patients received broad-spectrum antibiotics prophylactically according to the policy of the vascular unit at the time and this was extended for a period of five days. Only two of the patients who underwent colonic surgery had bowel preparation.

Results

Fifty-six patients were identified who underwent a synchronous aortic grafting with another intra-abdominal procedure (Table 1). Two of these patients had severe symptomatic occlusive disease that required urgent bypass grafting in association with a vagotomy with pyloroplasty in one and cholecystectomy in another. The other 54 all had aortic aneurysms repaired.

There were three deaths and all occurred within the first six days of surgery. Two patients died following aortic repair of ruptured aneurysms, one of which was complicated by an ischaemic infarcted colon requiring resection and the other by an ischaemic sigmoid volvulus, which was the preoperative diagnosis. The third patient had an aortic aneurysm repair and truncal vagotomy for chronic active peptic ulceration; he developed trash embolisation to his kidneys and other organs and died with multiorgan failure on the sixth day.

Seven patients required early reoperation (Table 2). Three others developed postoperative chest infections. Three patients had superficial wound sepsis while one patient, who had had an empyema of the gallbladder resected, had a complete dehiscence of his wound, which was treated conservatively because of prolonged cardiac problems. Incisional hernia was noted in two and deep vein thrombosis was managed in one case. The outcome for patients treated for carcinomas is listed in Table 3.

There has been no clinical evidence of aortic graft infection in any of the patients on long-term follow-up.

Discussion

The presence of an abdominal aortic aneurysm or serious aortoiliac occlusive disease and another intra-abdominal pathology present a management dilemma. The theoretical risk of graft infection has made most surgeons reluctant to perform a second non-vascular procedure at the time of aortic surgery.4,5 The tendency
has been to advise staged treatment in such patients, particularly for septic or potential septic bowel lesions, despite the problems of aneurysm rupture in the immediate postoperative period or the potential for tumour spread if a cancer is not treated at the first operation. Two major operations in close succession in elderly patients would also appear to double the opportunity for cardiac and pulmonary complications. An increased risk of graft infection with combined procedures is unproven and to us the problems of a single, but more complex and prolonged, operation seem unlikely to be worse than the problems associated with staged procedures.

It is impossible to assess the real incidence of these dilemmas retrospectively because series, which attempt to assess incidence, are highly selective and failed to define the incidence or criteria for exclusion because patients have been considered untreatable. However, this series demonstrates that the dilemma is a much rarer problem in association with occlusive disease and we have only treated two such patients, in contrast to 54 with aneurysms in the same period. One patient had gallbladder disease and the other had peptic ulceration. This is because urgent aortoiliac surgery for occlusive disease is rarely needed and there is an increasing number of alternative treatment options for these patients, usually with endovascular techniques.

From our early experience of 32 cases and review of the literature at the time, the conclusion was drawn that synchronous surgery could be carried out with advantage to patients without an inevitable risk of graft infection. Subsequent publications, although reporting small series of cases treated selectively, have shown that graft infection is not inevitable, and there is no evidence as yet that there is an increased mortality when compared with elective aneurysm repair alone. Our extended experience reinforces this message. Even in the presence of infected lesions such as acute diverticulitis or empyema of the gallbladder (2 cases), colonic resections with unprepared bowel (6 out of 8 long-term survivors) and complications such as wound infection and subphrenic abscess, none of the patients has to date developed a graft infection.

The unit selected an aneurysm size of 5 cm as the significant aortic diameter requiring resection in this series rather than the 6 cm now recommended for screened populations, unless the aneurysm was symptomatic. This was because it had been shown that untreated aortic aneurysms expand during the perioperative period with many authors reporting rupture in the interval period before elective repair could be scheduled. It seems appropriate to continue to select 5 cm as a critical diameter at which combined surgery should be considered the option of choice particularly where colonic surgery is required. Similar cases with aneurysms of a smaller size, i.e. 4.5 cm or less, have been discovered by, or referred to, our unit. In these patients the gastrointestinal problems have been treated in isolation and the aneurysms subsequently kept under observation. Although several have ultimately reached diameters of 5 cm and required operation, we are not aware of any that have ruptured prior to elective repair. Therefore, until it is known whether it is advantageous to resect aneurysms of 4.5 cm or less, it is considered inappropriate to treat them synchronously with a major gastrointestinal lesion if they are asymptomatic.

The heterogeneity of the intra-abdominal pathology treated at the same time as aneurysms and the relatively small number of cases make it difficult to draw many conclusions from the treatment of individual lesions. However, in this series and others, satisfactory results have been achieved with synchronous total gastrectomy and the two patients in our series illustrated the benefits of this strategy which gave them a prolonged period of relief before relapse of malignant disease after one year. Staged procedures would have made the period of symptomatic relief much shorter.

There is no evidence that combined procedure impairs the adequacy and potential curability of the surgery for carcinoma. However, from the experience of others there is a real risk of spread if surgery is staged, because the second operation is often delayed or even refused by the patient. The life expectancy in these cases is often short due to age at presentation, or the development of the metastatic disease. This is an additional reason to avoid staged surgery whenever possible (Table 3).

The order in which the procedures are carried out, particularly with bowel lesions, needs to be carefully planned. We have found it necessary to begin with gastrectomy prior to aortic grafting, as an unresectable carcinoma or unsuspected metastases may make aortic surgery inappropriate. However, in most other cases, including all those with biliary disease, colon disease and the patient with a bladder carcinoma, the aorta has been repaired first to minimise the possibility of contamination from the infected lesion.

We believe it is important to treat symptomatic biliary pathology, since the risks of cholecystectomy are very small but postoperative cholecystitis following aneurysm repair, as with other procedures, has a very high mortality.

Little data is available on treatment of co-existing intra-abdominal disease in aortic surgery. Our series...
represents one of the largest series reporting synchronous surgery. Although no firm conclusions can be made because of the heterogeneity of the associated intra-abdominal lesions, in the light of our experience, we believe synchronous surgery is safe. Our series was possible only because the vascular surgeons were sufficiently experienced in general surgery to perform the second non-vascular procedure. With emphasis on surgical sub-specialisation, it is increasingly likely that a second specialist would need to be involved in the treatment of the associated intra-abdominal lesion.

In summary, this series and others have shown no increase in morbidity or mortality when compared with other series of staged management. We believe that synchronous surgery should be the preferred treatment for patients presenting with aortic aneurysms of 5 cm or more in diameter in the presence of another symptomatic or life-threatening intra-abdominal pathology.

References

10 Norga JD, Paerolero PC, Nivatvongs S et al. Concomitant abdominal aortic aneurysm and colorectal carcinoma: priority with other series of staged management. 3, 8, 11, 12 We made because of the heterogeneity of the associated...