Arteriosclerosis, amputation and peptic ulcer

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Summary

In a series of 400 consecutive patients with arteriosclerosis seen in two peripheral vascular clinics, we confirm the previously reported association with peptic ulcer. The incidence was almost 25% both in patients with occlusive disease (300) and with aneurysm (100). The accepted expectation of peptic ulcer in the same age-group is 6 or 7% (Jones, Kirk & Bloor, 1970; McManus, 1966).

Patients with peptic ulcer, or the history of one, had a significantly higher amputation rate than those without a peptic ulcer.

Introduction

In a recent brief communication (Barabas, Bouhoutsos & Martin, 1971) we reported an incidence of 22.1% of peptic ulcer in 180 patients with occlusive arteriosclerosis of the abdominal aorta and its branches. Jones *et al.* (1970) in a necropsy study of ninety-nine cases of aneurysm of the abdominal aorta found ulcers in a similar percentage—22.6%.

We have now studied 400 patients, 300 with occlusive and 100 with dilating disease of the abdominal aorta and its branches, and confirm the practically identical association with ulcers in both groups. Although the reason for this association remains unexplained, we believe it has prognostic implications.

Material

The case records of 400 consecutive in-patients of Hammersmith Hospital and of Chelmsford District Hospital were studied. All were admitted between the years 1961 and 1971 for investigation and treatment of arterial disease and the finding of co-existing peptic ulcers was incidental. Occlusive arteriosclerosis was confirmed by aortography and dilating disease with abdominal aortic aneurysm at operation. Patients with diabetes were excluded from this series. Peptic ulceration was accepted as proved if a previous operation had been done, or on

barium meal examination, or at operation at the time of arterial surgery, or at necropsy. 300 of the 400 had occlusive disease of the aorta and lower limb arteries, and 100 had aneurysm of the abdominal aorta.

Results

Patients with occlusive disease

Of the 300 patients with occlusive arteriosclerosis, seventy-one (23.6%) had peptic ulcers, of which there were sixty-eight duodenal and three gastric. Before admission for investigation of the arterial disease forty-three of the seventy-one (60.5%) had undergone urgent or elective surgery for peptic ulcer. There was radiological confirmation of ulcer in the remaining twenty-eight (39.5%).

In every other aspect the remaining 229 patients without ulcer were comparable to the seventy-one with ulcer. There was no difference in age or sex distribution (Table 1), pattern of arterial involvement, or type of operation.

The later amputation rate amongst those patients with ulcer was higher, twenty-two out of seventy-one (31%), than amongst those without, thirty-four out of 229 (10.5%). Eleven of the twenty-two amputees in the ulcer group suffered bilateral amputation, whereas there were only nine (3.9%) bilateral amputees in the 229 patients without an ulcer (Table 2). As regards the 600 legs at risk in the whole group, thirty-three (23.3%) of the 142 legs of patients with ulcer were amputated, but only forty-three (9.6%) of the 458 legs of patients without ulcer necessitated this (Table 3). The differences are highly significant ($P=0.001$).

TABLE 1. Age and sex distribution in 300 patients with occlusive arteriosclerosis

	With peptic ulcer	No peptic ulcer
Number of patients	71	229
Average age	56.9	58.2
Sex — male : female	66 : 5	205 : 24

TABLE 2. Number of patients with amputation in a 10-year period in a series of 300 with arteriosclerosis

	Patients with peptic ulcer	Patients without peptic ulcer	Total
Number of patients	71	229	300
Number of amputees (unilateral)	11 (15.5%)	25 (6.6%)	36
Number of bilateral amputees	11 (15.5%)	9 (3.9%)	20
Total number of patients with amputation	22 (31%)*	34 (10.5%)*	56 (18.6%)

*Statistical significance: $\chi^2=8.26$; $0.001 < P < 0.01$.

TABLE 3. Number of legs amputated in a 10-year period in 300 patients with arteriosclerosis

	With peptic ulcer	Without ulcer	Total
Number of legs at risk	142	458	600
Number amputated	33 (23.3%)	43 (9.6%)	76 (12.6%)

Statistical significance: $\chi^2=17.56$; $0.0001 > P > 0.001$.

Patients with aneurysm

Of the 100 patients with aneurysm, twenty-four had peptic ulcers, twenty duodenal and four gastric. Before admission for management of the arterial disease, twelve of the twenty-four had undergone surgery for peptic ulcer. In the remaining twelve the diagnosis was established after barium meal examinations or at operation for the aneurysm. Because the great majority of patients with abdominal aneurysm do not suffer ischaemia from stenosing disease, there were no amputations in a follow-up period of up to 10 years.

Discussion

Almost a quarter of these 400 patients with arteriosclerosis also had peptic ulcers and either sex, with either aneurysmal or stenotic disease was equally affected. Elkeles (1964) first suggested this association after a radiological study of arterial calcification in patients with gastric ulcer. Jones *et al.* (1970) examined 7044 necropsy records and found

an incidence of peptic ulcers of 22.6% in ninety-nine cases with aneurysm but in the general necropsy population of the same age group only 7.2%. Two recent annotations fully discussed this link (Lancet, 1970, *British Medical Journal*, 1971).

The association of peptic ulcer with arteriosclerosis seems to have prognostic significance. Over a 10-year period our patients with ulcer had suffered a significantly higher amputation rate than those without, irrespective of the nature of the operation done (Table 2). In those with an ulcer the chances of losing a leg were from two to three times as high as in those without and the chances of losing both legs were four times as high. In every other respect, sex, age, pattern of disease and treatment the two groups were comparable. The high amputation rate in the ulcer patients, therefore, seems to be a consequence of an increased late failure-rate of initially successful arterial surgery.

References

- BARABAS, A.P., BOUHOUTSOS, J., & MARTIN, P. (1971) Aortic aneurysm and peptic ulcer. *British Medical Journal*, **2**, 767.
- BRITISH MEDICAL JOURNAL (1971) Aortic aneurysm and peptic ulcer (leading article). **1**, 129.
- ELKELES, A. (1964) Gastric ulcer in the aged and calcified atherosclerosis. *American Journal of Roentgenology*, **91**, 744.
- JONES, A.W., KIRK, R.S., & BLOOR, K. (1970) The association between aneurysm of abdominal aorta and peptic ulceration. *Gut*, **11**, 679.
- LANCET (1970) Aetiology of peptic ulcer (leading article). **ii**, 235.
- MCMANUS, J.F.A. (1966) *General Pathology*. Year Book Medical Publishers, Chicago.