PEPTIC ULCERS

AN ANALYSIS OF 700 CASES SEEN AND TREATED IN THE SURGICAL PROFESSORIAL UNIT, GENERAL HOSPITAL, SINGAPORE, FROM THE YEARS 1949 TO 1960.

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Peptic ulcers are far more common in the Western countries than in the State of Singapore. According to Doll[1] in 1951, about ten per cent of all the in-patients and the new out-patients attending the General Hospitals in Britain suffered from peptic ulcers. Basing on the returns of all the in-patients in the General Hospital, Singapore, for the year 1956, peptic ulcers were found in seven hundred and ninety-six cases among thirty-one thousand four hundred and forty-six patients, i.e., 2.5%. This article represents a review of seven hundred cases seen and treated in the wards of a Surgical Unit of one hundred and seventy-five beds. These were peptic ulcers confirmed either at operation or at autopsy and were seen between the first of January, 1949, and the thirty-first of December, 1960.

SEX

Six hundred and twenty-four males suffered from peptic ulcers as compared to seventy-six females in this series, i.e., a sex ratio of 8.2 M : 1 F. Three hundred and eighty-five males had duodenal ulcers as compared to forty-one females (9.4 M : 1 F) and two hundred and thirty-four males were affected with gastric ulcers as compared to thirty-four females (6.8 M : 1 F).

TYPES OF ULCERS

The types of ulcers encountered were of three kinds and these were duodenal, gastric and anastomotic. Table I shows the distribution of these ulcers.

TABLE I

DISTRIBUTION OF ULCERS IN 700 CASES

TYPES	Non-Perforated	Perforated	Total
Duodenal	243	183	426
Gastric	181	87	268
Anastomotic	5	1	6

Twelve of the repaired duodenal perforations subsequently returned for resection but are not included again in the over-all total although they were submitted to two operations each. The duodenal to gastric ulcers in this series is four hundred and twenty-six to two hundred and sixty-eight or 1.6 D.U. : 1 G.U.

CONDITION ON ADMISSION

The seven hundred cases were admitted into the wards either because of their symptoms or of perforation. Of the two hundred and seventy-one cases of perforation, eleven were in such poor general condition that no surgery was deemed possible or safe; these were therefore treated conservatively and were dead within forty-eight hours of admission. Their perforations were confirmed at autopsy.

It is interesting to note that three out of every four of the perforated ulcers gave no history whatsoever of a previous peptic ulcer complaint. This finding is in contrast to those of other centres[2, 3]. It is therefore not surprising that twenty of the one hundred and eighty-seven cases were justifiably mistaken for perforated appendices and operated on as such. The actual lesion was detected at this operation and thus repaired.

Of the four hundred and forty-one cases (inclusive of the twelve cases of previously repaired perforations returning with symptoms) nearly half of the patients were hospitalized because of troublesome vomiting from stenosis, bleeding or intractable pain. This is shown on Table II.

TABLE II

CONDITIONS OTHER THAN PERFORATION FORCING PATIENTS TO COME FOR SURGERY. 236 CASES.

CONDITIONS	NO. CASES
PYLORIC STENOSIS	101
HOUR-GLASS STOMACH	1
HAEMATEMESIS	86
MELAENA	16
PENETRATING ULCERS	32

The remaining two hundred and five patients were compelled to seek surgical relief because of recurrent pain causing socio-economic reasons such as loss of or absence from work and inability to obtain the necessary diet.

AGE

The age distribution of the seven hundred cases is seen on Figure 1. The youngest of the patients was sixteen and the oldest was seventy-nine years of age. Figures 2 and 3 show further analyses of duodenal and gastric ulcers respectively in relation to the age groups. It can be seen in Figure 2 that duodenal ulcers in this series occur at an earlier age than gastric (Figure 3) and are seen commonly from the age of twenty-one whilst the concentration of gastric ulcers begins at the age of thirty-one. The bulk of perforated duodenal ulcers (Figure 4) seems to be among the younger patients, i.e., between the ages of twenty-one to forty-five. In the cases of gastric ulcer perforations (Figure 5), the concentration is clearly confined to older patients, viz., between thirty-one and sixty-five. This contrast in the age distribution is again seen among the non-perforated duodenal and gastric ulcers and is indicated respectively on Figures 6 and 7.

SITES OF ULCERS

Over half of the peptic ulcers are duodenal. Table III shows the anatomical sites of these duodenal ulcers.

TABLE III
SITES OF DUODENAL ULCERS. 426 CASES.

SITES	WITH DEFINITE ULCERS		WITH STENOSIS	TOTAL
	Ant. Wall	Post. Wall		
FIRST PART	303	19	101	423
SECOND PART	2	1	0	3

Table IV shows the anatomical sites of the gastric ulcers.

RACES

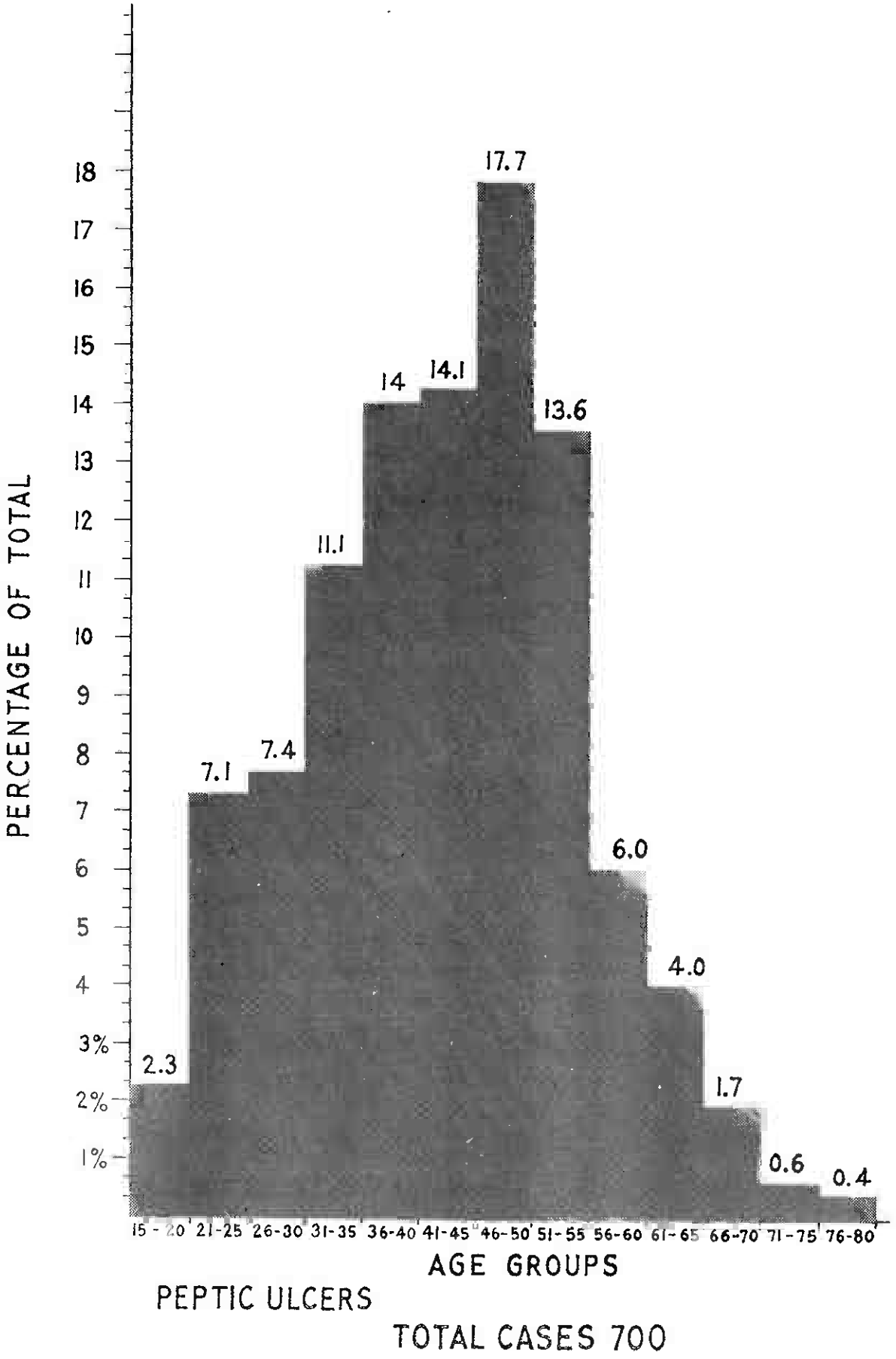
In a multi-racial State like Singapore, one is tempted to study peptic ulceration in relation to the many races domiciled in the State. However, in view of the infrequent presentation of peptic ulcers among the Malays and the rather low incidence among races other than Chinese, such an attempt would be futile. Table V shows the racial incidence of peptic ulcers among the seven hundred cases studied.

TABLE IV
SITES OF GASTRIC ULCERS. 268 CASES.

PYLORIC PORTION	ANTERIOR WALL	84
	POSTERIOR WALL	8
LESSER CURVE		121
	"VERY HIGH"	13
BODY	ANTERIOR WALL	27
	POSTERIOR WALL	12
FUNDUS	ANTERIOR WALL	0
	POSTERIOR WALL	1
GREATER CURVE		2

TABLE V
PEPTIC ULCERS AMONG THE RACES AND THE SEX INCIDENCE. 700 CASES.

RACES	MALES	FEMALES	TOTAL
CHINESE	525	71	596
INDIANS	63	1	64
MALAYS	13	0	13
BRITISH	8	2	10
EURASIANS	8	1	9
EUROPEANS	4	1	5
JEWS	3	0	3


PERCENTAGE OF TOTAL
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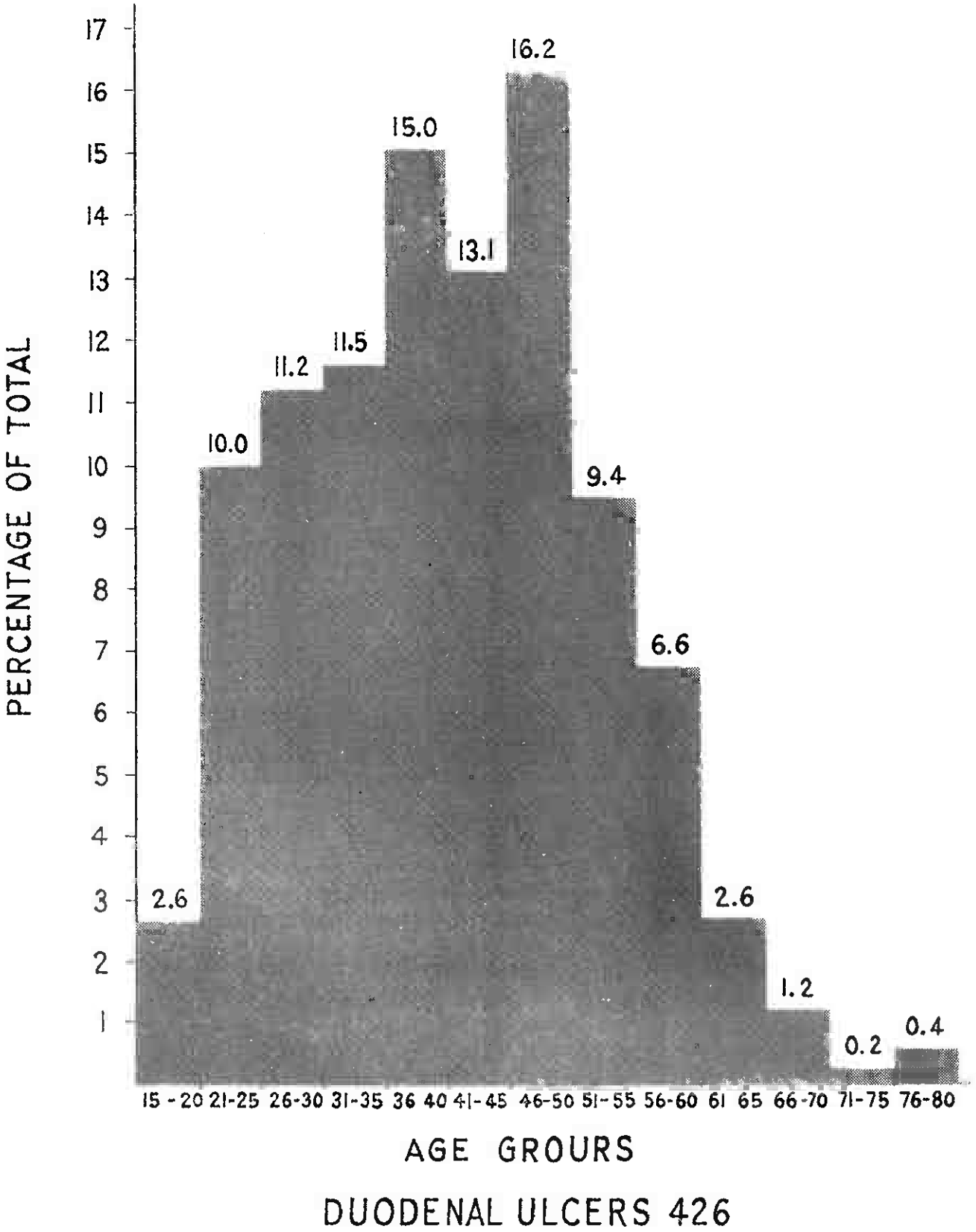
15 - 20
21-25
26-30
31-35
36-40
41-45
46-50
51-55
56-60
61-65
66-70
71-75
76-80
AGE GROUPS
PEPTIC ULCERS
TOTAL CASES 700

Figure 1.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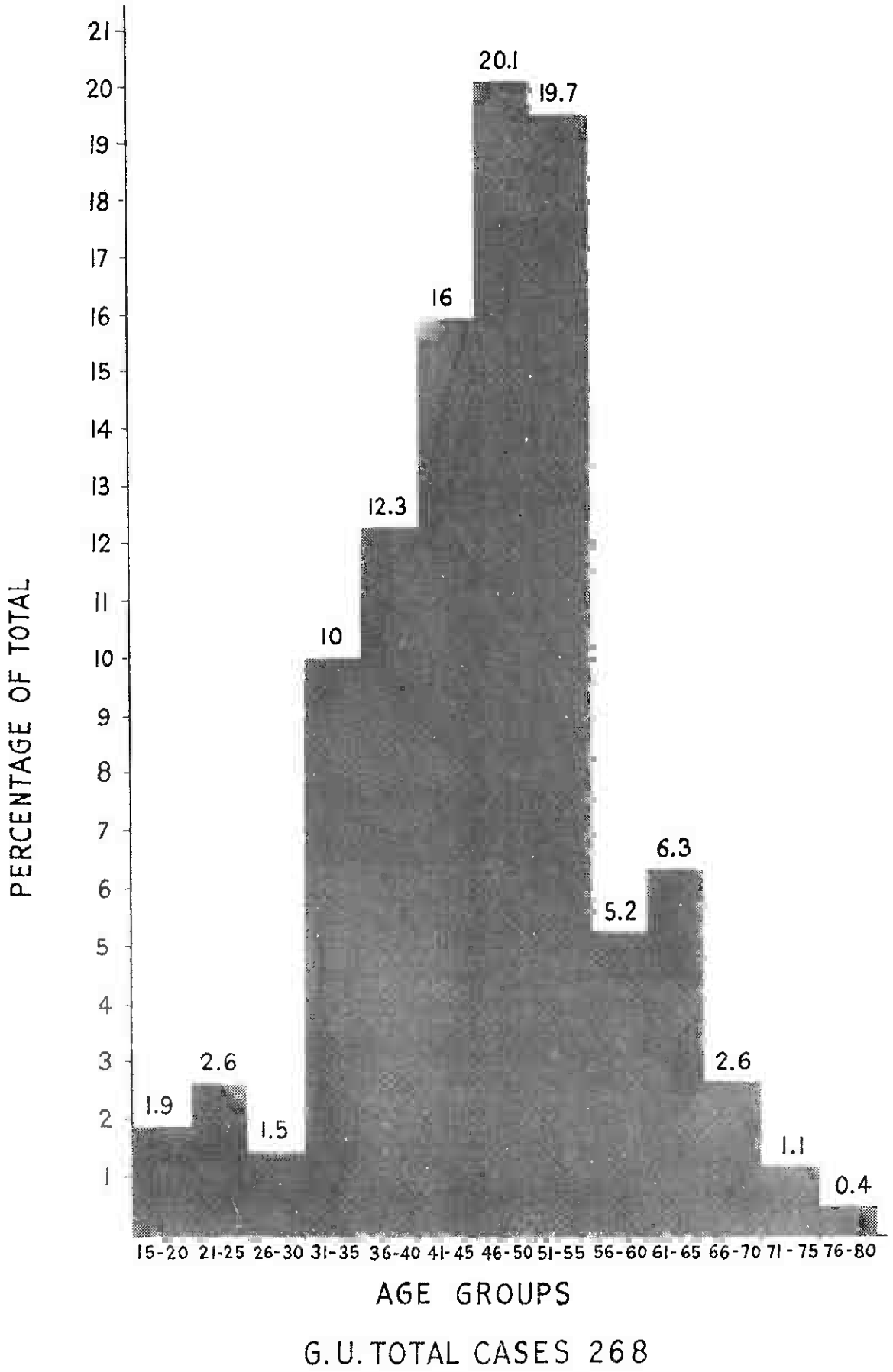
15 - 20 21-25 26-30 31-35 36 40 41-45 46-50 51-55 56-60 61 65 66-70 71-75 76-80
AGE GROURS
DUODENAL ULCERS 426

Figure 2.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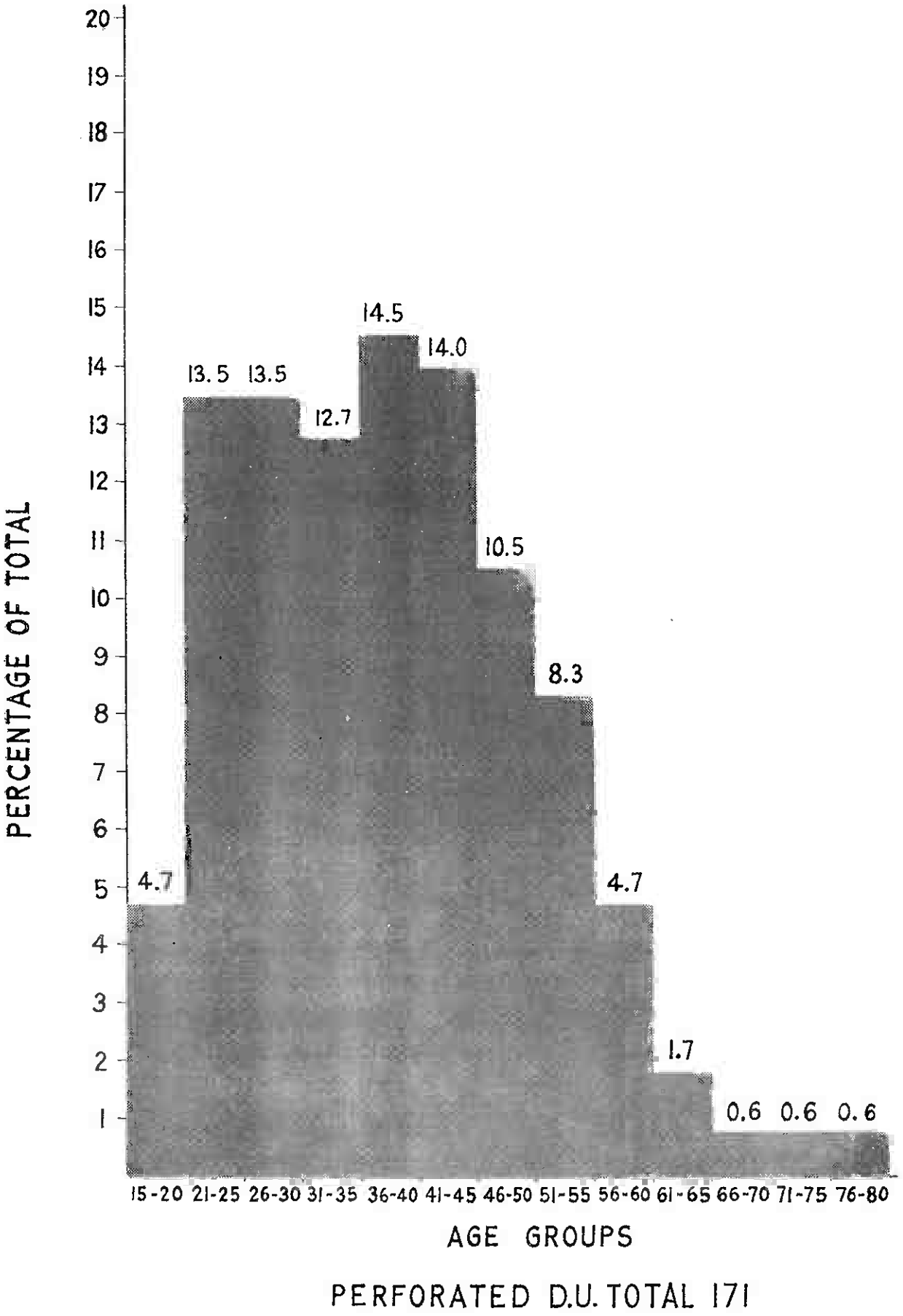
AGE GROUPS
G.U. TOTAL CASES 268

Figure 3.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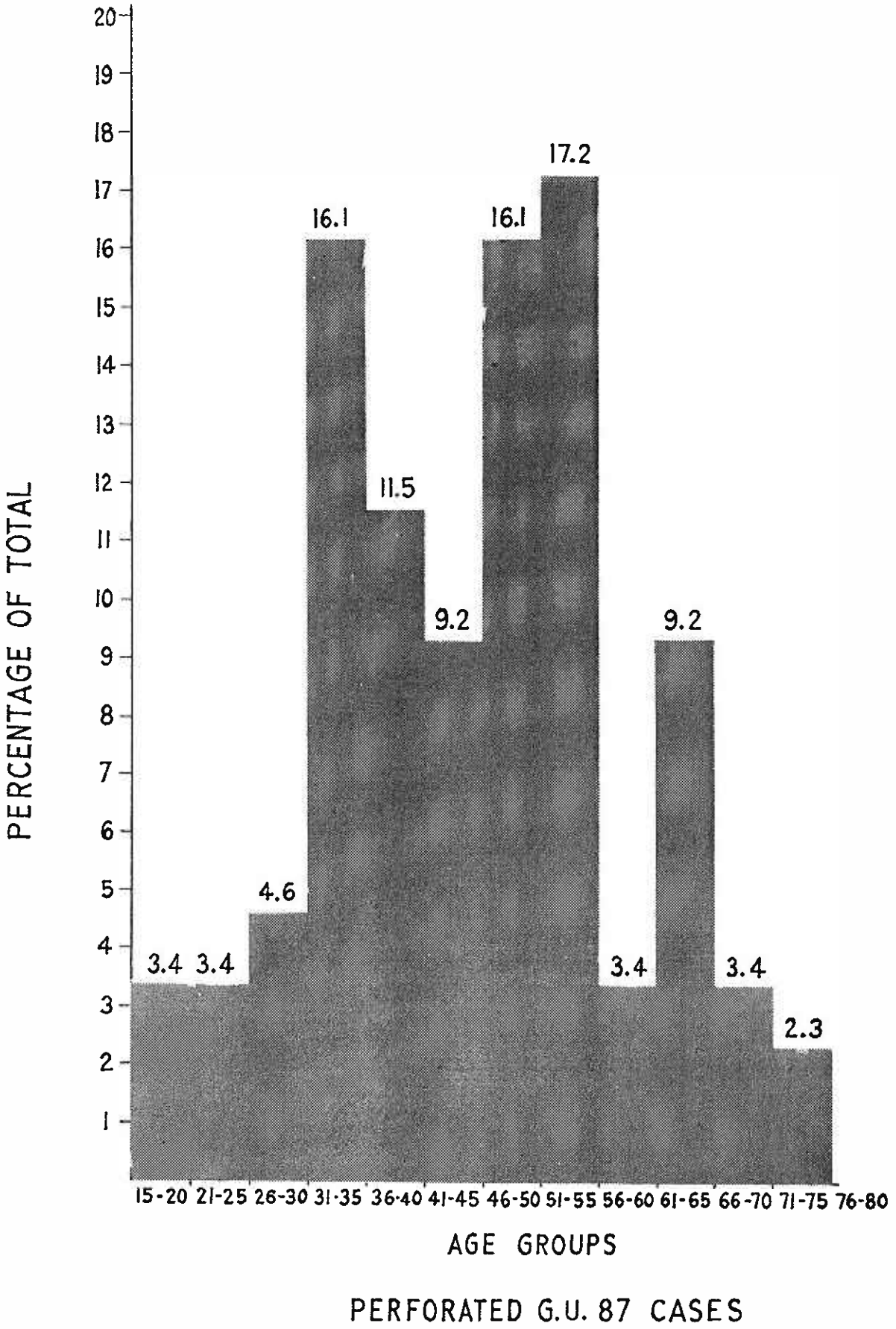
AGE GROUPS
PERFORATED D.U. TOTAL 171

Figure 4.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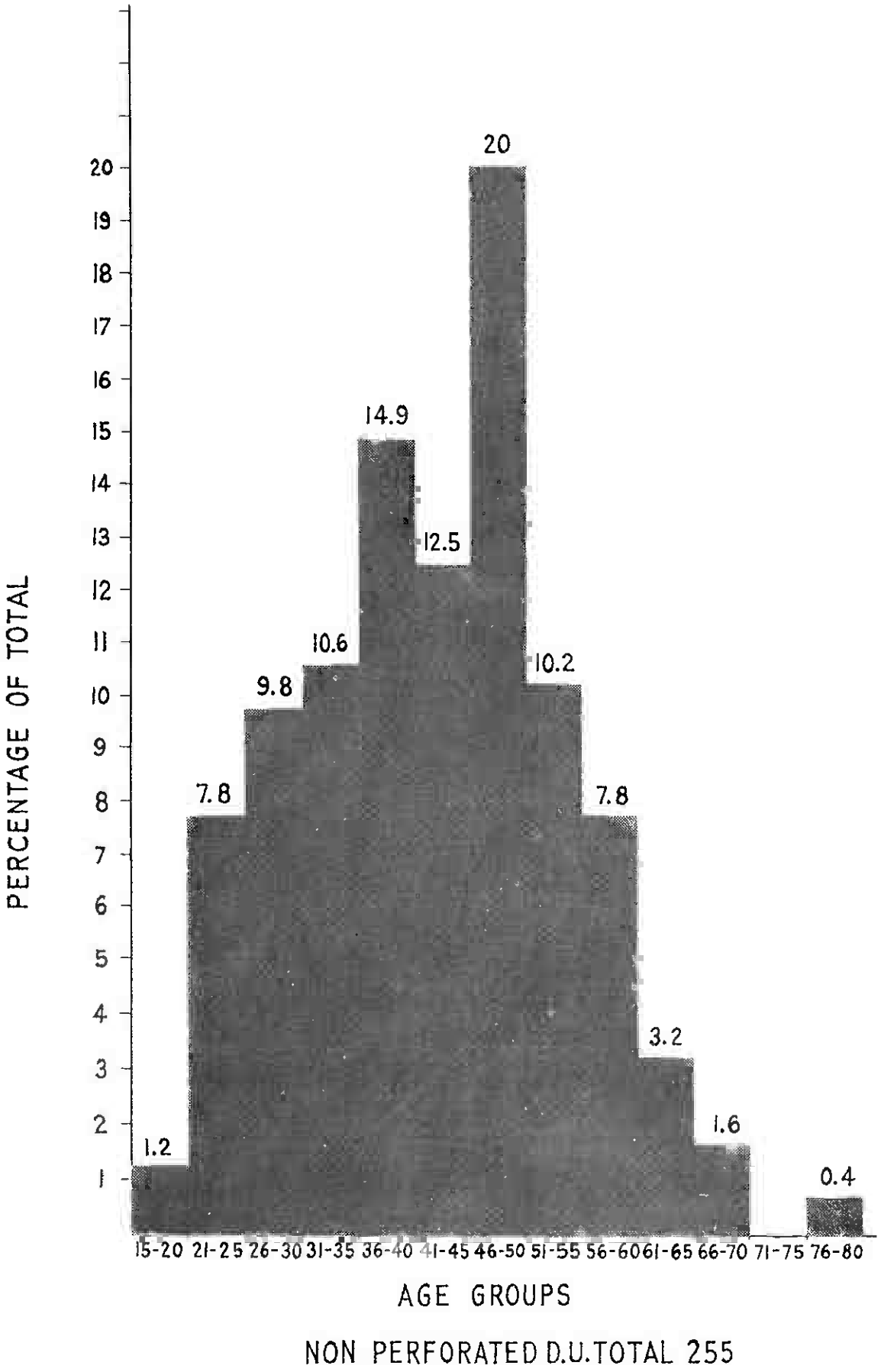
AGE GROUPS
PERFORATED G.U. 87 CASES

Figure 5.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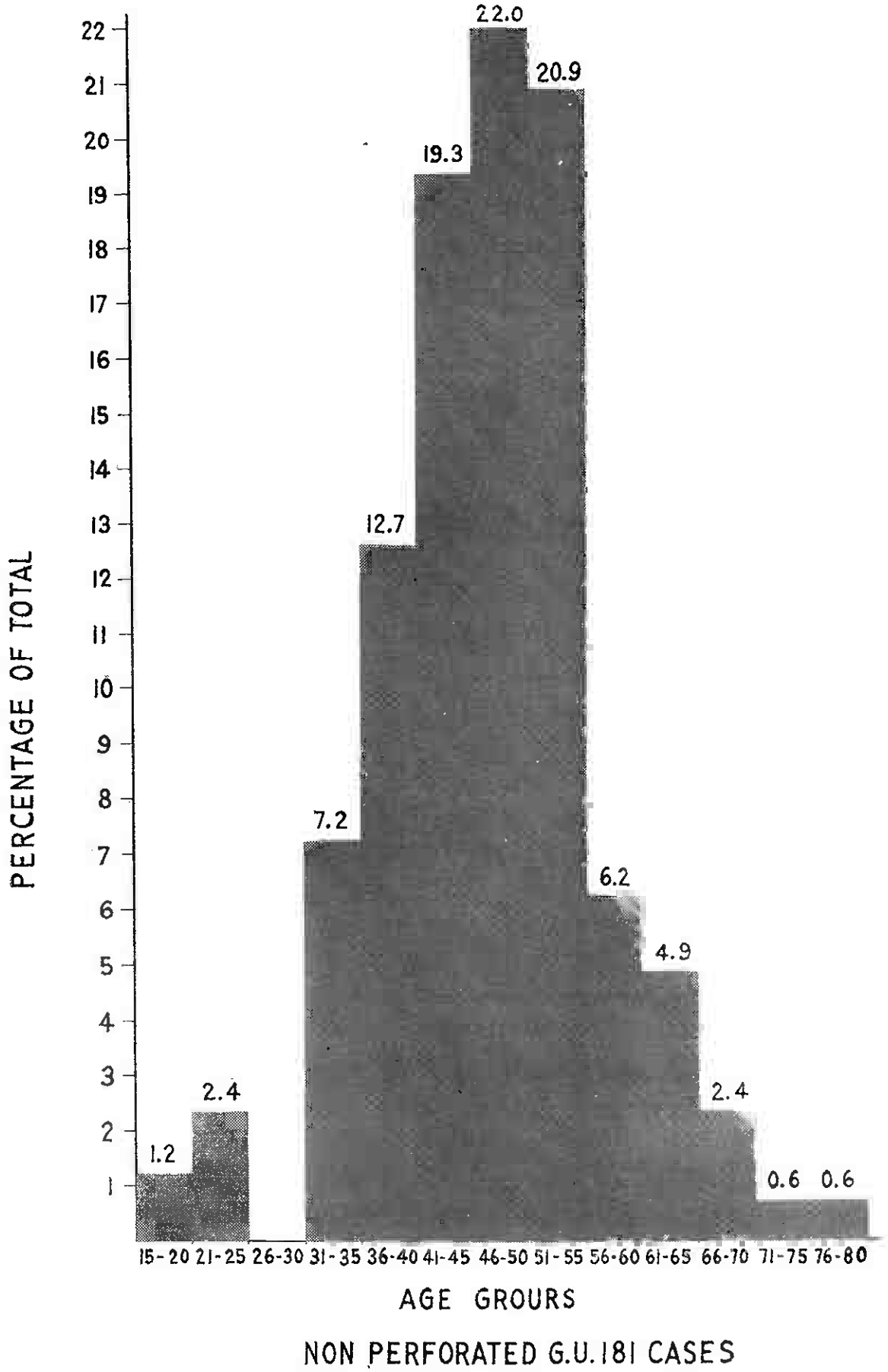
15-20 21-25 26-30 31-35 36-40 41-45 46-50 51-55 56-60 61-65 66-70 71-75 76-80
AGE GROUPS
NON PERFORATED D.U. TOTAL 255

Figure 6.


PERCENTAGE OF TOTAL
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20.9
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0.6
0.6
15-20 21-25 26-30 31-35 36-40 41-45 46-50 51-55 56-60 61-65 66-70 71-75 76-80
AGE GROURS
NON PERFORATED G.U. 181 CASES

Figure 7

The majority of the patients were Chinese and it will be of interest to analyse the ulcer incidence among the Chinese communities so as to see if any one community is more susceptible to ulcer formation than another. In order to facilitate this analysis, it will help to consider the percentage distribution of the Chinese communities among the Chinese population of one million ninety thousand five hundred and ninety-six as indicated in the Census of 1957. This percentage distribution of the total population is compared side by side with the percentage distribution of the five hundred and ninety-six Chinese patients and these are shown on Table VI. The sex distribution of the Chinese communities of the Chinese population is considered side by side with the sex distribution of the Chinese communities among the Chinese patients and this comparison is also shown on Table VI.

TABLE VI

PERCENTAGE DISTRIBUTION OF THE CHINESE COMMUNITIES IN RELATION TO THE TOTAL CHINESE POPULATION AND TO THE TOTAL CHINESE PATIENTS. SEX DISTRIBUTION IS ALSO SHOWN WITH PATIENT NUMBERS PLACED WITHIN BRACKETS.

Communities	% Chinese Population	% Chinese Patients	Males	Females
Hokkien	40.6	43.0	227,951 (230)	214,756 (26)
Teochew	22.5	20.6	126,658 (119)	118,532 (4)
Cantonese	18.9	16.3	92,275 (62)	113,498 (35)
Hainanese	7.2	9.2	43,931 (50)	34,150 (0)
Hakka	6.7	6.9	39,004 (35)	34,068 (6)
Foochow	1.5	1.7	9,624 (10)	7,204 (0)
Shanghainese	1.0	0.8	6,137 (5)	4,897 (0)
Henghua	0.8	0.5	4,933 (3)	3,824 (0)
Hockchia	0.7	0.8	4,360 (5)	3,254 (0)
Kwongsai	0.03	0.2	177 (1)	115 (0)
Other Chinese	0.1	0.0	613 (0)	635 (0)

Table VI shows that peptic ulcers are proportionately distributed among the Chinese communities and there is sufficient evidence to indicate that no one Chinese community is more susceptible to peptic ulceration than another. However, when the sex incidence is analysed among the communities, Table VI clearly shows that there is a predominance of peptic ulcers among the Cantonese womenfolk, as out of seventy-one Chinese females, thirty-five of them were Cantonese. No explanation is available as to the reason for this particular community having a higher peptic ulcer incidence among its females. This problem may form an interesting subject for the social workers to analyse.

TREATMENT

In the normal course of treatment, perforated ulcers are treated by laparotomy and suture of the perforation. Only eleven cases were not so treated as they were far too ill for surgery. Six of the perforated ulcer cases were judged suitable for gastric resection as they reached the operating theatre under six hours of perforation; one of these six perforations was due to an anastomotic ulcer, one had a repair three years previously and two had an associated haematemesis. Two hundred and fifty-four cases of perforation were subjected to the simple suture technique of repair and the mortality was twenty-nine or 11.4%.

Among the four hundred and forty-one cases of non-perforated ulcers (inclusive of the twelve repaired duodenal perforations who returned with pyloric stenosis) five were submitted to non-resective procedures. Thus, four hundred and thirty-six cases of non-perforated ulcers together with the six cases of perforation were dealt with by gastric resections and the mortality rate was seventeen deaths or 3.8%. Table VII shows the types of resection procedures carried out and the deaths arising from each procedure.

TABLE VII

TYPES OF RESECTION PROCEDURES AND THE DEATHS ARISING FROM EACH. 442 CASES.

PROCEDURES	TOTAL	DEATHS
POLYA	314	7
BILLROTH I	46	0
BILLROTH II	82	10

The mortality rate of resection among the one hundred and two cases of bleeding ulcers was three deaths or 2.9%. All the resected stomachs were submitted to histological examination and early carcinomatous changes were seen in six of the one hundred and eighty-one gastric ulcers and none in the duodenal ulcers.

PERIODS OF HOSPITALIZATION

The eleven cases of perforation judged too ill for surgery and treated conservatively died within forty-eight hours of admission. The twenty-nine patients who died following repair of their perforation survived on the average four days after being warded. Deaths arising from gastric resection occurred on the average on the eighth day. The average stay of the survivors from repaired perforations and gastric resections was sixteen and twenty-nine days respectively. In the cases of gastric resection, ten days on the average were spent on pre-operative corrective measures.

FOLLOW-UP OF THE RESECTED CASES

In this analysis, a long term follow-up is almost impossible as most of the patients have not been willing to be seen too often if they found themselves to be in good health. It is therefore not feasible to plan a two-year follow-up period for the resected cases. By taking a follow-up period of a minimum of six months, the maximum number of patients available is two hundred and seventy-seven cases, i.e., 65% of the four hundred and twenty-five survivors. Fifteen per cent, i.e., sixty-three patients, did not turn up at all in the follow-up clinic after their discharge. The reason for this absence is difficult to fathom. One can only hope they were so satisfied with their operations that they have considered returning for a check-up unnecessary. This is possible as these patients were discharged only when they could eat a normal diet without any undue complaint. Eighty-five of the patients attended only once or twice after their discharge and did not turn up again. Thus, thirty-five per cent of our resected cases can be considered to be lost to the records.

Of the two hundred and seventy-seven patients available for study, seventy-five, i.e., 27 per cent did not put on any weight. The weights of these patients were taken everytime when they attended their follow-up clinic. Ten (3.5%) of the patients complained of loss of weight, averaging three pounds. One hundred and ninety-two or 69 per cent of the two hundred and seventy-seven patients followed-up for a minimum of six months put on an average of ten pounds. The greatest increase in this group in six months is thirty-two pounds.

In assessing the post-gastrectomy condition of the patients, only two categories can be defined: those patients either have some complaints or have none. In the latter group, one can presume that the operation has been successful and the patients were satisfied with their treatment. This group is made up of two hundred and twenty-four patients, i.e. 81 per cent. In the former group, the main forms of complaint can be divided into three kinds and these are shown on Table VIII.

TABLE VIII

MAIN FORMS OF COMPLAINT. 53 PATIENTS, I.E. 19 PER CENT OF 277 PATIENTS.

COMPLAINT	NO. PATIENTS	%
DISTENSION AFTER MEALS	12	4.5
OCCASIONAL PAIN AND VOMITING AFTER MEALS	10	3.5
GENERAL WEAKNESS	31	11.0

Thus, it can be seen that in this series, no case of severe dumping is encountered although 8 per cent have probably slight dumping.

To sum up in this analysis of the seven hundred cases of peptic ulcers, one can say that three out of every five patients treated had duodenal ulcers. Two out of every five of the seven hundred patients came into the wards with perforation. Of the two hundred and seventy-one cases of perforation admitted, three out of every four gave no history whatsoever of a previous peptic ulcer history. Nearly half of the four hundred and forty-one cases of non-perforated ulcers came into the hospital for surgery because of other complications, e.g., stenosis, bleeding or penetrating ulcers. The mortality rate for repair of perforations was 11.4% and for gastric resections 3.8%. 3.3% of the resected gastric ulcers showed early carcinomatous changes.

The female population do not seem to suffer much from peptic ulceration with the exception of the Cantonese womenfolk.

In the short term follow-up 81% of the resected cases who were available have no complaints and are therefore consider satisfied customers.

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3. Schmitz, E.J., Harkins, H.N., Olson, H.H., Moore, H.E., Jr. and Merendino, K.H. (1953): Perforated Peptic Ulcer. Ann. Surg., 138, 689.