

13

Peptic Ulcer

JEREMY HUGH BARON, D.M., F.R.C.P., F.R.C.S., F.R.C.P.G.

Abstract

Indigestion and heartburn have been described for thousands of years, but it was only in the 16th century that the disease peptic ulcer was established by autopsy. At first, only gastric ulcers were identified. In the 18th century, duodenal ulcers, most of which were fatal cases after perforation or hemorrhage, were seen. In the 19th century, when autopsy became a common, even routine, hospital procedure, uncomplicated acute and chronic ulcers were found and then correlated with symptoms. Thus, our current clinical understanding dates from the 1820s, by which time peptic ulcers were being reported in the U.S. It is unclear why gastric ulcers were not diagnosed at The Mount Sinai Hospital until 1873 and duodenal ulcers until 1885. However, after that time both conditions were diagnosed frequently, and they rapidly became common and were treated medically and surgically. **Key Words:** History, gastric ulcer, duodenal ulcer, U.S.

GASTRIC SECRETION AND THE MUCOSAL BARRIER have been described in chapters 9–11, and surgical and medical treatments for peptic ulcer in chapters 10 and 14. This chapter explores the story of peptic ulcer through the centuries, in the U.S. and at The Mount Sinai Hospital.

Until recently, peptic ulcer was, as inflammatory bowel disease still is (see chapters 19 and 20), of increasing incidence, unknown etiopathology, and without rational cures. Our current understanding of the causative roles of acid and *Helicobacter pylori* and anti-inflammatory drugs in peptic ulcer does not explain its explosive increase in this century, so that historical research is necessary.

Upper abdominal discomfort and pain are described in ancient medical texts, and some patients who complained of a sour taste of bitter liquid may have had gastroesophageal reflux. Others may have had peptic ulcer, gall bladder disease or pancreatitis, but such retrospective diagnoses can be made only on autopsy reports, which were rare before the 16th century.

In the 15th century, Benivieni (1443–1502) described 111 cases, but only 15 of his autopsies have been published (1). One was a typical clinical case of

pyloric stenosis (xxxvi): “The body was cut open for reasons of public welfare. It was found that the opening of his stomach had closed up and it had hardened down to the lowest part with the result that nothing could pass through to the organs beyond. . . .” However, Benivieni did not report an ulcer (and he was familiar with perforations of the small intestine), so that the stenosis may have been due to linitis plastica rather than to ulcer disease. Morgagni described a similar case, in which the history of vomiting dated back to soon after birth and then again from age 33 to 57. Prepyloric contraction was found; it may have represented adult “congenital” hypertrophic pyloric stenosis rather than post-ulcer stenosis (2). The first pyloric stenosis in association with a gastric ulcer (which had perforated terminally) was reported in 1727 (3), and the first hourglass stomach in 1732 (4).

Goldstein (5, 6) cites early descriptions of gastric ulcer in 1479 (7), 1519 (8) and 1581 (9). One of the first autopsy-proven pyloric peptic ulcers was published in 1586 by Donatus of Mantua. The patient was a 59-year-old man of bilious disposition, who died after four days of acute and persistent vomiting (10). When Cardinal Caesar Boronius died in 1607 after intractable nausea, the autopsy showed three ulcers in the mouth (cardia?) of the stomach (11).

The Bolognese painter Elisabetta Sirani died suddenly in 1665 (at age 27) after a few months of abdominal pain and one day of severe pain and collapse. The autopsy showed that she had a perforation of the stom-

From the Dr. Henry D. Janowitz Division of Gastroenterology, Mount Sinai School of Medicine, New York, NY.

Address correspondence to Dr. J.H. Baron, Division of Gastroenterology, Box 1069, Mount Sinai School of Medicine, One East 100th Street, New York, NY 10029-6574.

ach; two doctors diagnosed an inflammatory ulcer. However, two other doctors attributed the hole to a corrosive poison, and a maidservant was tried for murder but not convicted (12). Charles I's daughter, Henriette-Anne, died suddenly in 1670 (at age 26) after a day of abdominal pain and tenderness. The autopsy, performed to see if she had been poisoned, showed peritonitis and a small hole in the anterior wall of the middle of the stomach. However, the doctors had never heard of a peptic ulcer, let alone a perforation, and attributed the hole in the stomach to the knife of the dissector (12, 13). An early report (about 1600) of perforated gastric ulcer in a doctor's wife, age 18, indicated that she died after four days of abdominal pain, vomiting and peritonitis; Bauhin, in 1679, concluded that inflammation of the stomach led to a gastric ulcer which then ruptured (14).

The first known gastric hemorrhage was reported in 1704 (15); it was thought to be iatrogenic: "It is clear that the stomach ulcer caused the large quantity of blood which had come from many open blood vessels but the cause of the ulcer one suspects could be due to the violent medicaments given the patient by a physician of little experience." Morgagni (16) described duodenal erosions (but not ulcer) (XXIX.20) in 1737 as well as gastric erosions and ulcers (in 1735), one of which (XXIX.14) had a hole which Morgagni was certain was a perforation and not a dissector's incision.

In 1791 in Padua, Jacob Penada saw an alcoholic butcher of 35 with a four-week history of abdominal pain, worse in the patient's final 24 hours, with vomiting and collapse. Autopsy showed, and Penada illustrated, a perforated ulcer on the anterior wall of the duodenum (17). Although he did a literature search, Penada was unaware of a similar case in 1746 (18) or Sir George Baker's case of hematemesis and melena from an ulcer in the first part of the duodenum, reported in a footnote in the second edition (1772) of his 1767 lecture on lead colic (19).

The first classification of stomach diseases came in 1793 from Matthew Baillie (20), with clear descriptions of acute inflammation (arsenic), trichobezoar, ulcer, perforation, pyloric stenosis, and scirrhus and ulcerated cancer. In 1817, patients with perforated gastric ulcer were reported in Dublin by Crampton (21), and patients with perforated duodenal ulcer were reported in London by Travers, who also noted bleeding, stenosing and penetrating gastric ulcers (22). Sometimes, in retrospect, early reports of ulceration or perforation of the duodenum appear to have been tuberculous (23) or malignant (24). Identification of the anatomy and pathology of *ulcus simplex chronica* of the stomach is usually attributed to Cruveilhier (25), but in various editions (26), Abercrombie had already covered symptomatology, pathology and complications of ulceration, both in the duodenum and the stomach, and had reviewed the literature, mostly French.

Proof that chronic stomach ulcers could cause pain came when patients with recurring, years-long chronic stomach pains died of another disease, and ulcers were found at autopsy (27), in contrast to such diagnosis being made after a fatal complication of the ulcer. Nevertheless, ulcers found at autopsy could have been coincidental, rather than causing the symptoms, as is suggested by the later report of a patient who died of heart disease who had never had stomach pains, yet was found to have a chronic gastric ulcer (28). Of Rokitansky's 79 cases of perforated ulcer, only 6 were duodenal, with 16 prepyloric, 15 lesser curve, 20 posterior, 5 anterior; 1 in the cardia and 16 multiple (29, 30).

Incidence of Gastric and Duodenal Ulcer

In 1857, Brinton (31) found a gastric ulcer or scar in 5% of all autopsies, whereas Perry and Shaw (32) found 70 duodenal ulcers in 17,652 routine postmortems (that is, 0.4%) at Guy's Hospital, London, 1826–1892. Of these 70 cases, 9 were fatal by hemorrhage, 8 by perforation, and 3 as the result of cicatricial narrowing either of the bowel or of the common bile duct (32). In the other 50 cases, the ulcer was found at routine autopsy.

Perry and Shaw (32) added to their own 70 cases another 81 from the British journals and hospital reports, to make a total 151 patients, 60 of whose complications included 32 with hemorrhage, 56 with perforation and 33 with obstruction. However, 91 of the 151 had been free of abdominal symptoms until complications or their death from other causes. Duodenal ulcer became more noteworthy after its convincing association in 1842 with burns, although Curling (33) was careful to point out that the association between burns and inflammation, congestion and ulceration of the intestine (but not specifically the duodenum) had previously been noted by Dupuytren (34) (and even earlier, in 1823 [35]). Moreover, three of John Hunter's six autopsies from 1755–1781 on patients with gastroduodenal erosions/ulcers (36) were acute, related to one patient with fever and two with fractured skull. A patient with gastric ulcers after burns was reported by Swan in 1823 (37), and one with both duodenal and gastric ulcers by Cooper in 1839 (38). Meanwhile, the 1st (1882) and 2nd (1892) series of the Index-Catalogue of the Library of the Surgeon-General both have three columns of citations, from 16 countries, of papers on duodenal ulcer (and 23 and 64 columns respectively on gastric ulcer), with 16 monographs on duodenal and 35 on gastric ulcers, mostly in German and French.

Peptic Ulcer in the U.S.

Goldstein (5) claimed that the earliest reference to a peptic ulcer in an American patient was in 1761 by Morgagni (16). However, Goldstein was relying on

Alexander's English translation of 1769 (16), where the "in an American" is a mistranslation of "in Marsupiali Americano," which was the opossum dissected by Tyson in 1698 (39); Morgagni had read of the dissection in a Latin report from that year (40) rather than in the English original (39). Nevertheless, Tyson was not only the first to report an animal with a (perforated) peptic ulcer, but he claimed to have seen three such perforated ulcers in patients, and in one he claimed he had foretold the diagnosis "before the *Patient's Death*" (41).

The first three Surgeon General's Catalogues list 64 reports on 101 patients with duodenal ulcer in the U.S. in the 19th century. It is interesting to compare their timing with the 68 reports from the U.K. on 211 patients, including the 201 cases collected by Perry and Shaw (32) (Table). It seems clear that, as in Britain, duodenal ulcer was increasingly reported in the U.S. from the middle of the 19th century, especially from the 1870s, after the diagnosis was made from fatal cases of hemorrhage and perforation.

With the advances in operative and anesthetic techniques, surgeons were able to perform laparotomy for gastric ulcer, at first for emergencies and then electively. Series of such operations with reviews of the literature were reported in the early 1900s, both from Leeds (42, 43) and the U.S. (44), and especially from the Mayo Clinic (45–47) which performed 2263 ulcer operations between 1906 and 1915 (48).

Peptic Ulcer at Mount Sinai

"Gastric Ulcer" appears in *Mount Sinai Annual Reports* continually from 1873, at first with about one case per year and increasing to five cases annually in the 1890s, but only with cases of perforation, stenosis or

hemorrhage. Then, according to the 1901 report of the 1st surgical division, Fannie S., a woman of 18, was admitted with epigastric pain and massive hematemesis, which continued for six days while she was in a bed in a medical ward. When she was exsanguinated, the internist requested the surgeons to perform laparotomy, which showed a large prepyloric lesser curve ulcer with a large vessel pulsating underneath its floor. She died 14 hours later. "Epicrisis — A fundamental rule of medicine is the checking of dangerous hemorrhage. There is no reason why a dangerous hemorrhage issuing from the stomach should form an exception to this rule. It seems that in this case more prompt interference might have checked the hemorrhage and eliminated the ulcer."

Duodenal Ulcer at The Mount Sinai Hospital

It remains unclear why duodenal ulcer was so rare at Mount Sinai until the early 1900s; possibly routine autopsies were not feasible on Jewish patients, but hemorrhage, perforation and stenosis would have been easily diagnosed while they were alive. "Duodenal Ulcer" appears in *Mount Sinai Annual Reports* as single cases in 1885 and 1893, with perforation in 1901 and 1902, as stenosis in 1903, as 5 cases of perforation in 1901 and 1902, as stenosing in 1903 and 1905, and as 5 cases of perforation in 1906, after which time the number of admissions increased each year. The 1901 admission was for right iliac fossa pain with pus found at incision at that site. However, no further exploration was done, and the autopsy showed perforations both in the duodenum 8 cm from the pylorus and in the ascending colon.

Admissions for peptic ulcer soon increased so rapidly that, in the two years 1903 and 1904, Berg's services operated on 1 duodenal ulcer and 18 gastric ulcers, of which 6 were uncomplicated, 3 each were after hemorrhage and perforation, 6 were with stenosis, and 1 was a recurrence after gastrojejunostomy (49). Such recurrences at Mount Sinai of peptic ulcer at the stoma after the then-standard operation led to the change in practice at Mount Sinai in the 1920s and 1930s from gastroenterostomy to partial gastrectomy (see chapter 10).

The commonest gastroenterological case at Mount Sinai in the 19th century was calculated to be gastralgia, meaning upper abdominal symptoms (see chapter 7). In today's clinics and private offices, these symptoms are similarly frequent. Some patients are diagnosed after tests as having peptic ulcer, gastro-esophageal reflux, gall bladder ulcer or pancreatitis, but most are categorized with the neutral and unhelpful term "non-ulcer dyspepsia," because it is still unclear whether there is a disturbance of function of the stomach (dyskinesia) or a functional disturbance of the patient. In 1882, the *British Medical Journal* claimed that the cause of dyspepsia in the U.S. was ice water (50): "The prevalent dyspepsia from which Americans suffer so much, and which is so

TABLE

Reports of Duodenal Ulcer in the 19th Century in the U.K. and U.S.

Decade	U.K.		U.S.	
	Reports	Patients	Reports	Patients
1810–1819	2	2		
1820–1829	2	6		
1830–1839	1	10	1	1
1840–1849	9	31	2	3
1850–1859	7	20	6	9
1860–1869	7	23	5	8
1870–1879	11	42	9	10
1880–1889	9	26	13	13
1890–1899	20	51	28	57
Total — 19th century	68	211	64	101

Sources:

U.K. and U.S. reports Surgeon General's Catalogues of 1882; 3:953–955, 1899; 4:557–559 and 1923; 4:782–796.

U.K. patients: Perry & Shaw 1893–1894 (32):70 cases from Guy's Hospital, London, 1826–1892 and 131 reports published between 1810 and 1892, for a total of 201. The Surgeon General's Catalogues provided 10 more cases.

40. *Acta Eruditorum* 1698; Tom XVII: 407–420; and *Acta Eruditorum*, supplementa 1702; Tom III, Section IV. pp. 149–162.
41. Baron JH. Edward Tyson's case of an American with gastric perforation. *J R Coll Physicians Lond* 1998; 32:265–267.
42. Moynihan BGA. On duodenal ulcer and its surgical treatment. *Lancet* 1901; ii:1656–1663.
43. Moynihan BGA. *Duodenal ulcer*. London: Saunders; 1910.
44. Weir RF. Perforating duodenal ulcers. *Med News* 1900; 1:690–696, 732–740.
45. Mayo WJ. Duodenal ulcer. A clinical review of fifty-eight operated cases, with some remarks on gastrojejunostomy. *Ann Surg* 1904; 40:900–908.
46. Mayo WJ. Ulcer of the duodenum from a surgical standpoint. *Br Med J* 1906; 2:1299–1301.
47. Mayo WJ. Ulcer of the duodenum, with report of two hundred and seventy-two operations. *J Am Med Assoc* 1908; 51:556–558.
48. Hunter A. Gastric and duodenal ulcers: mortality from operation. A study of the experience of the Mayo Clinic, Rochester, Minn. Association of Life Insurance Medical Directors. 1919.
49. Berg AA. A report of the cases of benign and malign diseases of the stomach and duodenum, treated in first surgical division during 1903 and 1904. *Mt Sinai Hosp Rep* 1903–1904; 4:178–205.
50. Editorial. Ice-water. *Br Med J* 1882; i:280.