again being carried out by the nursing staff. The following day he was pain-free, and convalescence was smooth and uneventful. He was discharged fit and well 12 days after operation.

Discussion

The treatment of acute pancreatitis has previously been based on its frequent association with cholelithiasis. It is our opinion that the findings of biliary calculi are coincidental, and that the pathological changes in the gland can be explained wholly in terms of a vascular catastrophe. The more serious or fulminating lesion can be explained by thrombosis or embolism of a main pancreatic vessel. Certainly the appearance of the gland at operation is supportive evidence, but the picture is clouded by the biochemical action, which releases a sanguineous or sero-sanguineous fluid rich in pancreatic ferments. If small areas only are involved they may be absorbed, converted into fibrous tissue, or calcified. It is impossible to reverse a pathological process which has involved sloughing or abscess formation, and this parallel may be seen in the upper or lower limb when embolism or thrombosis occurs in a main vessel. Survival of an organ depends on the location of the thrombosis or embolism, the state of the collateral vessels, and the presence or absence of vasospasm.

It is reasonable to suppose the same vascular phenomena take place in the pancreas, but the exact nature of the process must remain a matter of conjecture.

Andrew Dale (1952) reported optimistic results from the treatment of acute pancreatitis with splanchnic blocks. Our own experience of a single case before this publication supports his findings, but the mode of action is not understood. Ganglion-blocking drugs seem to produce an excellent result. The disease is robbed of its terrorizing pain. It, of course, cannot affect the established gangrenous or suppurative process in a gland which must be subjected to drainage.

In our experience exploratory laparotomy is indicated even if there appears to be no doubt about the diagnosis, as an assessment of the degree of destruction of the gland is then possible, and in the case of gangrenous, sloughing, or suppurative lesions drainage of the gland is indicated. Associated cholelithiasis should be ignored unless the pathology can be directly related to "inflammatory changes" in the pancreas. The inflammatory changes bear a striking resemblance to thrombosis or emboli of the main vessels to other intra-abdominal organs and the upper and lower limbs. Gangrene, sloughing, and suppuration follow gross disturbances of the blood supply, and the severity of the symptoms may be related to the extent of the infarction.

We feel, however, that types 1 and 2 of Fitz's classification might well be treated with drugs of the methonium group. In the cases reported hexamethonium was chosen arbitrarily. Each member of the methonium group varies in effect from ganglion to ganglion, and it may well be that some other member of the group would have a more pronounced action on the splanchnic ganglion. Paton (1951) suggests that tetramethonium may have this action.

In our two cases the relief of pain and the improvement in the general clinical condition were contrary to previous experience. We feel that a vascular catastrophe is the causative factor in acute pancreatitis, and further investigation along these lines may lead to a better understanding of the disease and simplify the treatment.

ADDENDUM.—Since submitting this paper for publication two further cases have been treated with equally successful results. *Case 3*, a man aged 62, admitted with severe abdominal pain, general collapse, and urinary diastase of 75. Diagnosis was confirmed by exploratory laparotomy, and he was treated with hexamethonium bromide. He was discharged on the tenth post-operative day and has remained free of symptoms for five months. *Case 4* was that of a man of 72 with typical acute abdominal pain. The urinary diastase was 68. Exploratory laparotomy confirmed the diagnosis, and treatment with hexamethonium relieved him of his pain. He was discharged from hospital on the twelfth day and has remained free from symptoms for four months.

We are grateful to Mr. Edward Muir for his interest and co-operation.

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LOCAL EFFECTS OF CERTAIN MEDICAMENTS ON THE TEETH

BY

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It is a common experience for dental surgeons to be confronted by small children, aged from 2 years upwards, suffering from gross caries of their deciduous dentition. This condition may arise from a variety of causes, and it is often difficult to decide what is the principal factor in a particular case. If, however, a child known to have normal dental structures suddenly develops rapid decay affecting particularly the labial and buccal surfaces of his teeth, the possibility of chemical damage must be considered. It has been observed that such damage often occurs after the protracted use of some of the commonly used iron tonics.

Certain of these iron tonics are very acid. Representative samples, tested with a Cambridge pH meter, gave the following hydrogen-ion concentrations:

	Undiluted pH	Diluted to 50% with water	
		pH	pH
Syr. ferr. phosph. co.	1.5	..	1.9
Mist. ferr. sulph. pro infant., N.F.	1.67	..	2.28
Elix. ferr. glucon., R.F.H.	3.52	..	3.8
Mist. ferr. et ammon. cit., N.F.	6.66	..	7.7
"Colliron"	8.56	..	8.87

The deleterious effect of acids on the teeth is well known. McClelland (1926) showed that teeth left in a solution of pH 4.5 for twelve hours suffered some degree of decalcification, and Stafne and Lovstedt (1947) reported many cases of dental damage following the prolonged and regular sipping of pure lemon juice (pH about 2.5). Hardwick (1950) has demonstrated that the amount of enamel decalcification that occurs when a tooth is immersed in an acid solution does not depend entirely on the pH of the solution but also on the nature of the acid. For example, N/100 lactic acid, with a pH of 2.9, in some circumstances produced etching of the enamel, whereas N/100 hydrochloric acid (pH 2.0) did not.

A laboratory test to ascertain the effect on the teeth of certain stock iron tonics was carried out. Sound teeth were suspended for a week in the various liquids at blood temperature with part of the crown immersed beneath the surface. In this case the resultant degree of damage to the teeth was proportional to the acidity of the solution. Syr. ferr. phosph. co. caused the most damage, the exposed enamel flaking freely away from the cusps of the tooth. Mist. ferr. sulph. produced severe etching and decalcification of the enamel, which could be scraped off the surface with a finger-nail. Elix. ferr. glucon. produced very slight etching, with milky-white decalcified areas. No macroscopical effect was observed on the teeth immersed in mist. ferr. et ammon. cit. or colliron.

It is the custom to advise that some iron tonics, notably Parrish's food, should be taken through a straw or a glass tube, but this presents practical difficulties, and in small children the parent usually gives it undiluted from a teaspoon, the child sucking the liquid over his upper incisor teeth. If this practice is continued for long the teeth often present a typical clinical picture—decalcification of the labial surfaces of the upper incisor teeth, usually accompanied by dental caries. If, as is often the case, the tonic is sweetened with syrup, the risk of caries will be considerably increased. In severe cases the teeth eventually disintegrate, break off level with the gum, and leave roots that quickly become diseased.

Syrup *per se* has been observed to cause damage to the teeth. The original sugar dummy, where the parent wrapped a lump of sugar in a handkerchief and thrust it in the child's mouth, has been popularly superseded by the immersion of a rubber dummy in rose-hip or blackcurrant syrup before use, with frequent replenishments throughout the day and night. This, if continued for any length of time, results in a startling destruction of nearly all the teeth. The pH of a popular brand of blackcurrant syrup is 3.

It is not suggested that dental damage invariably follows the use of iron tonics. The amount of harm depends on the acidity of the tonic; on the frequency, length, and method of administration; and on individual susceptibility. But the regular introduction into the mouth of highly acid and syrupy fluids is obviously a potential risk to the dental structures.

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Medical Memorandum

Spontaneous Rupture of the Oesophagus Treated by Operation

Although, following Barrett's comprehensive review in 1946, the symptomatology of spontaneous rupture of the oesophagus is firmly established, failure of recognition remains the greatest impediment to successful treatment. If the diagnosis is made early, and immediate operative repair effected, the patient has an excellent chance of complete recovery. It is clear from recent reports, both British and American, that, in spite of the occasional survival of a patient after repeated thoracentesis, plus delayed drainage of the pleural cavity or of a localized abscess, the treatment of choice is immediate operation, and the transpleural approach seems preferable to the mediastinal one. To the growing list of successful cases the following is added.

CASE REPORT

On January 4, 1950, a manual labourer aged 53, without previous history of digestive upset, was admitted to hospital with the complaint of severe left-sided pain of six hours' duration. He had been celebrating the New Year holiday by an indulgence in alcohol much beyond his wont, and he felt rather seedy when he returned to work on the 4th. At the mid-day break he ate, without appetite, his lunch, and thinking that some beer might act as a stimulant he drank a pint, and felt, if anything, rather worse. He thereupon, in continued hope, had a second pint, and he had not long finished it when he felt sick, and brought up a large vomit of food and beer. He continued to feel uncomfortable and he retched violently, and as he did so was seized with a sudden excruciating pain in the left side about the lower part of the chest. He distinctly remembers that he had expected to vomit on this occasion, but did not in fact do so. The pain was so agonizing that he was almost struck to the ground. He was helped to his home, and six hours later, about 6.30 p.m., was admitted to hospital. The original pain over the left chest was still present, and it had spread across the epigastrium and through to his back between his shoulder-blades.

On admission he was pale, distressed, and sweating; his temperature was 96.8° F. (36° C.), pulse 112, respiration 22, and blood pressure 110/85. There were dullness and diminished air entry over the left lung base, and some tenderness but no rigidity in the epigastrium. He was originally thought to be suffering from pneumonia. At 10.30 p.m. his blood pressure had fallen to 98/70 and his pulse had risen to 150, while the left lung base was completely dull on percussion and breath sounds were absent. The left chest was needled and brown turbid fluid, smelling of beer, aspirated. No subcutaneous emphysema was observed. At this stage a diagnosis was made of spontaneous rupture of the oesophagus with perforation into the left pleural cavity, and arrangements were put in hand for operation, an intravenous plasma drip being set up. In spite of this and the administration of morphine, the patient continued in great pain and severe shock.

Operation was carried out at 1.30 a.m., the left thoracic cavity being opened through the bed of the eighth rib. About 2 pints (1.1 litres) of opaque brown fluid, smelling of beer, welled out of the pleural cavity and there was considerable contamination of the cavity with food particles. A ragged tear about 2 in. (5 cm.) long was found in the pleura over the lower end of the oesophagus, and a longitudinal tear about 1 in. (2.5 cm.) in length in the left postero-lateral wall of the oesophagus an inch or so above the diaphragm. The rent in the oesophageal wall was clean-cut and healthy-looking, the tissue around it greyish black and necrotic. It was notable that whenever the pleural cavity had been cleared of stomach contents the condition of the patient greatly improved. The rent in the oesophagus was easily repaired with interrupted catgut sutures, and the wound in the chest wall closed, the pleural cavity being drained through a stab wound.

The next day the patient's condition was satisfactory and it remained so. Fluids were allowed by mouth on the second post-operative day. Convalescence was somewhat retarded by a haematoma at the posterior end of the thoracotomy wound, and a slight purulent discharge from the stab wound, so that he did not leave hospital until February 1. On his discharge he felt reasonably fit but was troubled with a slight cough. He was referred back to hospital on February 17 because of increasing breathlessness and cough. X-ray examination then showed an abscess cavity in the lower lobe of the left lung. While the patient was awaiting admission to the thoracic unit he coughed up the contents of the abscess, and thereafter the pulmonary infection rapidly resolved. He returned to work in April and has been in full work since and in excellent health.

COMMENT

The history of the abortive vomit with sudden agonizing pain and collapse in a previously healthy man, the profound shock, only partially alleviated by plasma transfusion, the resistance of the pain to morphine, and the rapidly increasing dullness at a lung base suggested the diagnosis: the aspiration from the left pleural cavity of stomach contents confirmed it. The absence of clinical evidence of surgical emphysema may be accounted for by supposing that the gastric contents, having ruptured the oesophagus, very rapidly tore a large gap in the left pleural membrane, and that gastric contents and air found a readier egress into the pleural cavity than into the tissues of the mediastinum. This case supports the view that the best hope for patients with spontaneous rupture of the oesophagus is early operation, and that much time should not be lost in pre-operative attempts to overcome shock completely, for this end is unlikely to be achieved except by operation.

I wish to thank Dr. James Brown and Mr. David Proctor for making the diagnosis, and Dr. James Stewart for the excellent anaesthetic management of a very ill patient.

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