Surgical progress 1975

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Introduction

With the wave of violence that is now sweeping the world, no excuse need be given for starting this review with a consideration of the surgical implications of this modern epidemic. Man's ingenuity in destroying himself seems fortunately well matched by medical progress in saving lives of seriously injured patients. The management of benign stricture of the oesophagus has always been a teasing problem and has received a good deal of study in recent years; a number of important papers in this field are reviewed. Peptic ulcer, its aetiology and treatment, remains an enigma and there is no sign of the stream of papers on this subject diminishing in any way. Some of the more abstruse problems of diagnosis and management of patients with haematemesis are then reviewed, followed by some of the exciting advances being made in biliary diseases. That all too common problem, the patient with the advanced and apparently hopeless intra-abdominal cancer, is then considered, followed by some recent interesting papers on bladder stone and hydradenitis suppurativa. Finally, a miscellany of papers which have caught the reviewer's eye in 1975 is reported. Once again, as in previous years, it must be pointed out that this review is heavily flavoured by the author's own hobbies and interests and must necessarily reflect the limited reading of the vast bulk of surgical publications by one individual.

Surgery of violence

Although it is 30 years since the end of World War II, there is never a time when war, these days usually disguised under some pseudonym, is not in full flame or smouldering on somewhere or other over the globe. Moreover, civilian violence in many horrible forms is manifesting itself in more and more communities. In both situations, sophistication in weaponry brings with it new and more terrible injuries which are, fortunately, still being matched by advances in the technology of trauma surgery.

Melsom, Farrar and Volkers (1975) give an account of eighty casualties, mainly due to explosive devices, treated by a British field surgical team in Oman. Seven died before reaching the surgical

centre but of the seventy-three who were treated, over 50% having major injuries, all but two survived. These authors point out the importance of rapid evacuation. In World War II and in Korea evacuation time to hospital was in the region of 6 hr and deaths from wounds were respectively 3.5 and 2.2%. In Vietnam, with an evacuation time of 40 min, the mortality fell to 1.6%. The other important factor is efficient first aid, particularly airway control, control of blood loss and occlusion of chest wounds. The anaesthetist has a vital part to play in the treatment of battle casualties. Davidson and Cotev (1975) report their experience in the Yom Kippur war of 1973. It was estimated that as many as 10% of casualties reaching field hospitals required intensive care and respiratory assistance. These particularly included the chest injuries, trauma to head, neck or brain and major burns. It is vital that medical orderlies are trained to maintain the airway. Perhaps the most outstanding example of this was an RAMC sergeant in Northern Ireland who performed an emergency tracheostomy on a private with a severe bomb injury to the neck. He used a disposable scalpel that he kept in his jacket pocket, a syringe casing as a tracheostomy tube and maintained the airway during the 2-hr evacuation by using a syringe as a sucker. The sergeant received a well deserved B.E.M. (Boyd, 1975).

One of the most important lessons from Belfast has been the importance of immediate tracheal intubation followed by controlled ventilation in the management of missile wounds of the head. This has been most effective in reducing intracranial pressure and this has been monitored both by the use of a pressure transducer introduced through the wound and by direct inspection of the exposed brain. Controlled ventilation reduces intracranial pressure in two ways: first, it lowers the central venous pressure, which in turn prevents engorgement of the intracranial venous system; if the patient is allowed to cough or breathe stertorously, the central venous pressure rises. Second, the controlled ventilation allows the blood gas levels to be maintained. Reduction of the P_{CO_2} level to 25 mmHg by hyperventilation encourages cerebral vaso-constriction

which reduces the brain volume. All patients with severe gunshot wounds of the head had controlled ventilation continued for 2 or 3 days after surgery in order to regulate blood gas tensions and to lower the central venous pressure. Pressure studies in the early post-operative period show that the intracranial pressure tended to rise with even slight respiratory obstruction (Gordon, 1975).

Belfast also provides us with an example of the new pathologies produced by civilian violence. Millar and his colleagues (1975) describe the injuries in ninety patients caused by rubber bullets. There was one death, and seventeen patients in the series had permanent disabilities or deformities, including eight ruptured globes of the eye (one bilateral). In forty-one patients the injuries necessitated admission to hospital. The rubber bullet is a blunt missile which is intended to administer a painful slap severe enough to deter stone throwers, but is not intended to cause major injuries and it is the sophisticated mechanical descendant of the wooden club or baton. The authors point out that the chief fault of this weapon is its inaccuracy. No serious injuries resulted from impacts in the lower limbs and only one from low on the abdomen. However, impacts on the chest and head rather frequently produced serious injuries. But it is impossible to avoid vulnerable areas of an individual and moreover the bullet may miss the target completely and strike another person. These authors conclude that it would be desirable to replace the present missile with one whose accuracy is considerably increased without a simultaneous increase in wounding potential. But they point out, however, that if rubber bullets were withdrawn and the soldiers were armed only with rifles and automatic weapons it is certainly possible that the mortality and morbidity would be much higher.

There is no doubt that the severely injured patient today has a better chance of surviving than ever before and with a lower morbidity; these undoubtedly are the result of increasing sophistication of treatment. Romanoff (1975), for example, reports 142 cases of wounds of the chest treated in Israel during the 6 day war of 1967 and the Yom Kippur War, many of a massive nature, in which the total infection rate was a remarkable 4.9% (seven patients). This is in contrast to World War II infection rate in such injuries of around 50%. The good results appear to be due to a combination of early drainage of haemothorax, or evacuation of clot if this has developed, prolonged antibiotics, and avoidance of thoracotomy as a primary treatment unless there are certain definite indications for this. In this series, thirty-eight patients were treated with a tube drain only without a single example of infection. However, large wounds require surgical debridement and operation is also required in the

face of continued bleeding. Where possible, resection of lung tissue is avoided and haematoma of the lung should be left undisturbed. After thoracotomy the chest wall itself is closed with delayed suture of the soft tissues.

Massive injuries of the liver, which until recently carried an extremely high mortality, have now been reduced to the region of 30%. Vajrabukka and his colleagues (1975) discuss the post-operative problems and management of eight patients following right hepatic lobectomy for blunt liver injury. There is often associated multiple trauma and in particular there may be accompanying chest injury so that most patients require at least temporary positive pressure ventilation. In the post-operative period there may be life-threatening hypoglycaemia in the first 48 hr. Jaundice is common and occurred in all eight patients in this series. The authors advise the use of T-tube drainage after hepatic lobectomy in order to exclude any possible extrahepatic obstruction. Hypoproteinaemia and hypoalbuminaemia occur in the immediate post-operative period and recovery rapidly follows the peak period of regenerative activity of the liver, so that normal levels are regained by the fourth to sixth post-operative week. Haemorrhagic diathesis is common after hepatic resection and is of a complex nature. Intravascular coagulation may occur and factor V deficiency is common. The mainstay of treatment is fresh blood transfusion. Provided that the patient can be nursed through the critical early days, the ultimate result can be excellent since liver regeneration is rapid and indeed histological evidence of regenerative hyperplasia is present within 3 days of injury.

Yellin and Rosoff (1975) describe ten patients with massive trauma to the duodenum, pancreas and adjacent organs treated by pancreatoduodenectomy. Eight were due to gun shot wounds and two resulted from blunt trauma. In addition, the liver was injured in seven cases, five had co-existing injuries of major vascular structures and there were eighteen additional injuries, including stomach, small bowel, colon, rectum, urogenital system and brain. The amount of blood required ranged from 12 pints to 50 pints in the intra-operative period. It is quite remarkable that in these massive injuries the authors achieved four survivors. Two of the six deaths were not related to the pancreatic or duodenal injuries; one resulted from the associated gun shot wound of the brain and another patient had severe pulmonary fibrosis and coronary artery disease.

Throughout the major cities of the United Kingdom, hospital staffs are wisely introducing and rehearsing major accident procedures and more and more of them, unfortunately, have had the unpleasant experience of having to put the drill into active use. Fortunately, a large number of excellent papers have

now been published on the organizational aspects of civilian disasters which are of considerable value in drawing up such plans. The British Medical Journal has published an excellent little book on 'Surgery of Violence' (1975) which is well worth study. Gray and Coppel (1975) describe the twelve-bedded intensive care unit (I.C.U.) at the Royal Victoria Hospital, Belfast, which is placed in close proximity to the accident and emergency centre. Of the 2040 patients admitted between October, 1970 and November, 1974 as a result of disturbances, 208 required treatment in the I.C.U. The severity of the injuries can be gauged by the fact that eighty of these patients died, particularly those with head and multiple injuries. Tucker and Lettin (1975) give a useful account of the Tower of London bomb explosion which brought thirty-seven casualties to St Bartholomew's Hospital. They stress that the classical precepts of radical debridement and delayed primary or secondary suture must be rigorously adhered to in the treatment of open wounds if complications are to be avoided. The frequency of serious ear and eye injuries after an explosion of this nature makes it important that the injured are all examined by an ophthalmologist and ear specialist at an early opportunity. The experiences of the medical staff at the Moorgate tube train disaster (British Medical Journal, 1975) showed the great value of the anaesthetists at the site of the accident, particularly in circumstances such as this where crush and chest injuries were common. It was disappointing that the two patients admitted with the crush syndrome in which, in each case, both legs had been compressed for 12 and 6½ hr respectively, died. Both had raised serum potassium on arrival and both when catheterized produced only a small amount of brown urine. In both cases fasciotomy was performed to decompress the muscles, insulin and glucose treatment was commenced and peritoneal dialysis initiated. The authors raise the question of whether early removal of the limbs should have been performed; as the legs were both crushed at the groin, high bilateral amputations, in fact, would have been necessary.

Benign stricture of the oesophagus

Most patients with non-malignant stricture of the oesophagus are examples of reflux oesophagitis in association with a sliding hiatus hernia. Our increasing understanding of the pathology of this disease has led to its much more effective treatment in recent years. Franklin (1975) has traced the development of surgery of this condition. By painful experience he has learned that simply to dilate the stricture or to carry out a plastic operation to enlarge the lumen will often lead to further stricture

formation unless steps are taken at the same time to prevent reflux. It has also been shown that, in some cases, a stricture which appears at first to be completely irreversible is capable of resolution if reflux can be prevented. As a result of his extensive experience of 128 patients, Franklin advises that if a number 16F bougie can be passed through the stricture under anaesthesia, repair of the hiatus hernia, prevention of reflux by Nissen's fundoplication (in which the fundus of the stomach is sutured to produce a cuff of stomach wrapped around the lower oesophagus as an anti-reflux device) and pyloroplasty should be performed. If it proves impossible to pass the bougie, resection of the stricture and a high gastro-oesophageal anastomosis is performed with the addition of a pyloroplasty. Williamson (1975) gives an interesting account of eighty-three adult patients with benign oesophageal stricture and advises that bouginage should always be attempted before proceeding to surgery. Thirty-eight patients were thus treated and twenty-one of these obtained good results, although there were three deaths. Forty-five patients came to surgery with thirty-two achieving good results and three deaths. Where reflux symptoms are marked, surgery comprises simple bouginage with repair of the hiatus hernia but resection with oesophago-gastric anastomosis is required when there is a troublesome long stricture. Twelve cases were thus treated with no operative deaths, although three needed post-operative medical treatment for reflux. Williamson is against inter-position of jejunum or colon since these extensive procedures must add to the morbidity and mortality of resection even though they may avoid the chance of future reflux of acid peptic juice.

Peptic oesophageal stricture has no regard for age, and in the series reported by Hollenbeck and Woodward (1975) the ages ranged from 3 to 85 years among their forty-five patients. These were all examples of firm fibrous oesophageal peptic strictures which were impossible or very difficult to dilate safely. Three had scleroderma in association with their reflux and all forty-five patients had extensive transmural oesophageal fibrosis. These authors advise that the stricture be dealt with by the Thal patch technique. In this operation, the stricture is incised longitudinally and widened by using the adjacent gastric fundus sutured over the defect as a serosal patch. The operation is then completed by carrying out a Nissen fundoplication as an anti-reflux device. There were no deaths in this series and thirty-one patients obtained good results, another eight had reasonable relief of symptoms and six were classified as poor. One of these was subsequently found to have a malignant stricture, and the authors therefore advise routine biopsy at the time of surgery because of the possibility of an associated

carcinoma even in the presence of an obvious hiatus hernia and peptic stricture.

A rather different and interesting approach to the management of these patients described by Royston, Dowling and Spencer (1975) is of particular value in those difficult problems where reflux oesophagitis with stricture formation complicates previous surgery on the diaphragmatic hiatus. A second operation on this region is often a complicated and hazardous procedure, particularly in the elderly, and results are frequently disappointing. These authors base their approach on the increasing evidence that biliary and pancreatic secretions may be partly responsible for the mucosal damage in reflux oesophagitis. Their procedure comprises preliminary dilatation of the stricture followed by resection of the antrum of the stomach and Roux-en-Y jejuno-gastric anastomosis without resection of the oesophageal stricture. This results in diversion of the pancreatic and biliary secretions some 45 cm distal to the stomach remnant. Their series comprises eight patients, six of whom had had at least one previous operation for repair of the hiatus hernia. There was one post-operative death, but the remaining seven patients all had complete relief of heart burn. Two were cured of dysphagia without further dilatations, four required one or two further dilatations and the remaining patients still required less frequent bouginage.

It is standard surgical practice to combine any operation in which the lower end of the oesophagus is resected with a pyloroplasty. The rationale of this procedure is that the oesophagectomy must invariably result in a total vagotomy and this is likely to interfere with pyloric emptying. Indeed, many surgeons will have encountered examples of pyloric dysfunction following oesophagectomy in which this drainage procedure has not been carried out and certainly the present author has had one such patient. It is interesting, therefore, that Angorn (1975) reports ten examples of resection of the lower end of the oesophagus with oesophago-gastric anastomosis in which pyloroplasty was not performed. At 6 months, eight had excellent and two had satisfactory results with no evidence of oesophagitis or gastritis at endoscopy and no pyloric obstruction; he believes that drainage is totally unnecessary after oesophago-gastrectomy. Pyloroplasty is, however, such a simple procedure to carry out at the time of initial surgery that even if only a minority of patients are likely to get gastric retention, the reviewer would consider that this risk is not worth taking and will continue to be old-fashioned.

Corrosive strictures of the oesophagus are fortunately extremely rare in the United Kingdom but this is not so in Russia and in the Far East. Balasegaram (1975) reports a personal experience in

the management of 116 patients with early corrosive burns, mostly from sodium hydroxide, treated in Malaysia over a 10-year period. Initial treatment comprises intravenous fluids, antibiotics and sedation. Hydrocortisone is commenced and a Ryle's tube is passed immediately in order to maintain the patency of the oesophageal lumen. A barium meal is carried out soon after admission in order to define the extent of the lesion. After 3 weeks, dilatation therapy is commenced under general anaesthesia and indeed in more recent cases this is being performed after 10 days. Dilatations are carried out weekly for 6 weeks and then monthly for up to a year. Ten of the 116 patients were admitted in a state of shock and died within a few days from extensive necrosis of the oesophagus and stomach with perforation and mediastinitis. Of the remaining 106 patients, eight developed strictures of the oesophagus and three of the pharynx and larynx. Replacement surgery was carried out on these eleven patients using pedicled grafts of stomach, jejunum or colon. Three patients developed pyloric stenosis which required gastro-enterostomy.

An unusual cause of benign oesophageal stricture has been reported by Howie and Strachan (1975). This was a lady of 42 with mitral and aortic incompetence resulting from rheumatic fever. Cardiac screening showed enlargement of the left atrium. As part of her treatment for congestive cardiac failure she was given Slow-K. She then developed dysphagia and barium swallow examination showed almost complete hold-up of barium just below the carina. Oesophagoscopy and biopsy confirmed a benign mid-oesophageal stricture and she was treated successfully by repeated bouginage. These authors have collected three other examples where oesophageal compression due to an enlarged left atrium has resulted in hold-up of Slow-K with irritation and stenosis. There is sufficient evidence to contraindicate the use of slow-release potassium chloride when treatment, particularly cardiac surgery, for example, requires a period of recumbency when hold-up of the preparation is particularly likely to occur, or when there is any other cause of delayed transit time along the oesophagus.

Peptic ulcer

Aetiology

Gastric and duodenal ulcers are common diseases yet little is still known of their causation. Duodenal ulcer now seems to be becoming less frequent both in this country and the U.S.A. and gastric ulcer has declined even more sharply. Moreover, there has been a tendency for duodenal ulcer to join gastric ulcer as a disease of the socially underprivileged (Leading Article, 1975a). Gastric ulcer seems to be relatively infrequent in people living in India and

Africa. By contrast, duodenal ulcer is common in those areas. In Africa, there are wide variations in distribution of duodenal ulcer (Tovey and Tunstall, 1975); it is common along the Congo and Nile rivers, West Africa and Ethiopia but no definite aetiological factor can be determined. In both Africa and India stenosis is a particularly common problem compared with haemorrhage and perforation, which are both comparatively infrequent.

Du Plessis (1975) gives an excellent résumé of the potential causes of a gastric ulcer. There may be increased ulcerogenic properties of acid and pepsin; thus gastric ulcer is occasionally seen in the Zollinger-Ellison syndrome as a result of high acid secretion, and gastric stasis, which allows acid and pepsin to penetrate the mucus barrier, may be complicated by gastric ulceration. Impaired defence against acid and pepsin may be due to interference with the protective layer of mucus and may be brought about by aspirin, steroids, possibly alcohol and particularly by duodenal reflux. Finally, there may be possible vascular causes which interfere with the regenerative ability of the gastric epithelial cells. Du Plessis is a strong advocate of the duodenal reflux theory. He notes that the evidence in favour of this mechanism in the development of the usual lesser curve chronic gastric ulcer is circumstantial, but summarizes the points as follows:

- (1) Reflux of duodenal contents causes atrophic gastritis.
- (2) Atrophic gastritis renders the mucosa more prone to gastric ulceration.
- (3) Abnormal duodenal reflux can be demonstrated in people with gastric ulcer.
- (4) Chronic atrophic gastritis, extending from the pylorus for a variable distance proximally, is present in chronic gastric ulcer.
- (5) The gastritis is primary and not secondary to the gastric ulcer, is not confined to the area around the gastric ulcer and persists after the ulcer has been healed by medical treatment.
- (6) The gastric ulcer occurs in the mucosa affected by the gastritis.

Delaney, Broadie and Robbins (1975), in an elegant series of experiments in dogs, exposed a tube of stomach *in vivo* to pancreatic juice alone, bile alone, and the two in combination. They demonstrated marked gastritis in all three preparations but whole jejunal contents caused more severe changes than bile or pancreatic juice alone. Abtahi and Djahanguiri (1975) were able to produce gastric ulceration in the rat by intraperitoneal injection of indomethacin. They demonstrated that this ulceration would progressively reduce as the bile was diverted more and more distally to the ampulla of Vater, suggesting that bile reflux plays a part in indomethacin ulceration. In spite of both human and

animal evidence, the final proof that bile reflux in man actually produces ulcer remains to be confirmed or refuted. The aetiology of duodenal ulcer is also subject to debate. In addition to gastric-acid hypersecretion, possible mechanisms include disturbed emptying patterns, defective acid secretory inhibition and reduced duodenal neutralization.

In spite of the tens of thousands of patients who have undergone various types of surgery in centres particularly interested in reporting the results of treatment, it is true to say that the choice of operation for both gastric and duodenal ulcer remains the subject of much controversy. Most surgeons would advise gastrectomy with gastro-duodenal anastomosis (Billroth I) as the method of choice for gastric ulcer. Miguel (1975) found a 19% recurrence rate following selective vagotomy and pyloroplasty for chronic uncomplicated gastric ulcer and concludes that this is unacceptably high.

In duodenal ulceration, however, there has been an increasing tendency toward conservative surgery. Subtotal gastrectomy has been followed by total vagotomy combined with some form of gastric drainage, this in turn was challenged by selective gastric vagotomy, in which only the stomach was denervated, again combined with drainage, and recent years have seen the introduction of highly selective vagotomy, preserving the nerve supply to the antrum and pylorus without the need for gastric drainage. There is no doubt that proximal gastric vagotomy (or highly selective vagotomy) represents an attractive proposition in that it prevents excessive acid production with minimal upset of other gastrointestinal functions (Leading Article, 1975b).

Johnston and his colleagues (1975) have demonstrated that results are equally good in hypersecretors of hydrochloric acid as in those patients with less vicious levels of acid production.

Although at first reserved for uncomplicated duodenal ulcer requiring surgery, recently McMahon and his colleagues (1976) have applied this operation to patients with pyloric stenosis, combining the vagotomy with dilatation of the stenosed duodenum via a small gastrotomy incision. In a series of twenty-three patients thus treated the results were satisfactory and indeed better than those obtained in a similar group of patients treated by the more conventional approach of vagotomy combined with a drainage procedure, although two of their patients required re-operation for persistent stasis.

In spite of enthusiastic claims for this most conservative of all duodenal ulcer operations (Amdrup, Andersen and Hostrup, 1975; Grassi *et al.*, 1975; Hedenstedt, 1975), the results must still be interpreted with care, particularly as long term follow-up is still not available in large numbers of patients from many clinics. Kronborg and Madsen

(1975) report on 100 patients randomized between highly selective vagotomy and selective vagotomy with pyloroplasty. The follow-up was only from 1 to 4 years but already there was a recurrent ulceration rate of 22% in the highly selective group compared with 8% in the selective vagotomy group. However, dumping, diarrhoea and epigastric fullness was significantly lower after the more conservative operation.

Early follow-up reports of random trials from other centres either show little difference between the two techniques or come down in favour of highly selected vagotomy. Koffman and his colleagues (1975), from Sheffield, report a randomized trial of ninety male patients submitted to either highly selective vagotomy or truncal vagotomy and pyloroplasty. There were no deaths and no statistical difference between the functional results in the two groups at an average of 1 year after operation. There was one proved ulcer in the highly selective group. Diarrhoea was less after highly selective vagotomy (8%) than after total vagotomy and pyloroplasty (22%) but in no case was this troublesome. Kennedy and his colleagues (1975), from Belfast, carried out a controlled trial comparing proximal gastric vagotomy in fifty patients with a similar group undergoing selective vagotomy and gastrojejunostomy. There was one definite recurrence in each group. Patients in the first group had significantly less dumping, nausea and bile vomiting than in the second, and indeed their post-operative grading was similar to that of a controlled series with no known gastro-intestinal disease! The only patient in the series in whom diarrhoea caused much trouble came from the selective vagotomy and gastro-jejunostomy group, although five other patients in this group had mild diarrhoea and there were two in the proximal gastric vagotomy series. To determine whether the differences in this trial were due to the gastro-jejunostomy itself or the innervation or denervation of the gastric antrum, a further comparison was made between the patients who had undergone selective vagotomy without drainage with a further twenty-four patients who had undergone selective vagotomy combined with gastro-jejunostomy. Mild dumping was present among four of the fifty undrained patients and among seven of the twenty-four patients with gastro-jejunostomy, three of these having moderate or severe symptoms. Gillespie (1975), reviewing the situation, concludes that control trials have not shown significant overall difference in the results of the various standard operations for duodenal ulcer, nor can the laboratory predict the operation of choice, nor can it be shown that the mental state of the patient necessarily affects prognosis and he concludes that in the majority of instances the knowledge of the basal

output of acid and response to maximal stimulation is of little value.

One must always bear in mind the small but significant mortality and morbidity of even these conservative procedures. Kalaja and his colleagues (1975), from Copenhagen report the accidents and complications encountered in 146 selective vagotomies with drainage and ninety-six highly selective vagotomies without drainage. They encountered seven examples of perforation of the stomach, three ruptures of the spleen, four haemorrhages from the lesser omentum, a 4% incidence of wound infection, gastric retention in five of their selective vagotomies and four highly selective vagotomies and three deaths (total mortality of 1.1%). One of the deaths was directly attributable to operative perforation of the stomach. However a collected survey of over 5000 highly selective vagotomies revealed an operative mortality of only 0.3% (Johnston, 1975). Temple and McFarland (1975) carried out twenty consecutive highly selective vagotomies and found five developed persistent reflux. They attributed this possibly to a slight disturbance of the oesophago-gastric angle when performing this operation. Reflux does not appear to have been a significant problem in other published series. Halvorsen and his colleagues (1975) report an example of localized avascular necrosis of the lesser curve of the stomach after highly selective vagotomy. The pathogenesis was probably related to the relative poverty of the submucosal blood supply along the lesser curve. Their fatal case was the fourth to be reported and they suggest that the lesser curve should be peritonealized in order to obviate this complication. A further case, reported by Moore and Wyllie (1975), developed melaena, the day following surgery, due to a large oval ulcer on the lesser curve which at second operation developed at a touch into a free perforation. Recovery followed a high partial gastrectomy. A further case reported by Hoile and Turner (1975) developed a gastric fistula 7 days after highly selective vagotomy which healed under conservative treatment.

The diarrhoea which may follow vagotomy in some patients can be troublesome and difficult to treat. Condon and his colleagues (1975) suggest that division of the vagal hepatic fibres results in distension of the gall bladder, contraction of which expels increased quantities of bile salts, which swamp the reabsorptive capacity of the small intestine and induce diarrhoea by direct action on the colon. They treated six patients with post-vagotomy diarrhoea with the bile acid-binding resin, cholestyramine, with satisfactory results. Allan and Russell (1975) confirmed these findings in a double-blind controlled trial. Eight patients with severe continuous post-vagotomy diarrhoea were given 4 g of cholestyramine

daily for 2 months and eight similar patients were given a placebo for a similar time. A significant improvement was recorded in the treated group but not in those receiving the placebo.

Gastro-intestinal haemorrhage

Massive gastro-intestinal bleeding remains a serious and common challenge to physicians and surgeons alike. While the majority of patients in this country are found to have either acute or chronic peptic ulcer, there is a large catalogue, which seems to be ever increasing, of unusual sources of bleeding. Axon and Clarke (1975) report three patients who presented with symptoms suggesting a Mallory-Weiss tear. Endoscopy showed a localized, clearly demarcated area of bright red mucosa near the gastro-oesophageal junction with an area of normal gastric mucosa between the lesion and the oesophageal site of entry. This was thought to have arisen by retrograde intussusception of the stomach during vomiting or retching and may have been responsible for the haemorrhage. Lock (1975) documents a fatal gastrointestinal haemorrhage, in a male aged 29 years, due to metastatic deposits in the stomach and jejunum from a testicular tumour which was a combined teratoma and seminoma containing foci of chorion-carcinoma. Modern sophistication in investigating chronic intestinal bleeding is demonstrated by a case report (Hall, 1975) of a bleeding Meckel's diverticulum diagnosed by mesenteric arteriography in a young man whose gastro-intestinal radiographic studies had been negative. Bacourt, Lauru and Guez (1975) successfully treated an elderly woman of 79 whose haematemesis was due to a ruptured aortic aneurysm which had fistulated into the jejunum. The first stage comprised resection of the aneurysm and its graft replacement, the second was an axillo-bifemoral by-pass with removal of the prosthesis as a prophylactic against its almost certain infection. Prasad, Chatterjee and Johnston (1975) dealt with a massive haemorrhage from a false aneurysm of a branch of the gastro-duodenal artery in the head of the pancreas (secondary to chronic pancreatitis) by coagulating the feeding vessel via an arterial percutaneous catheter. Complete occlusion of the artery was confirmed by further angiography—a truly remarkable feat of radiological ingenuity.

Rasmussen and his colleagues (1975) point out that kidney transplant patients are particularly likely to develop duodenal ulcer and are especially prone to haemorrhage from this source. Among 229 patients undergoing kidney transplant in Copenhagen between 1968 and 1973, fourteen had duodenal ulceration requiring treatment; of these, eight bled and six of these died. Peptic ulcers are particularly common in patients with uraemia, undergoing transplantation and dialysis. They consider that their

increased liability to haemorrhage is due to the immunosuppressive therapy.

The use of the fiberoptic endoscope has revolutionized the accurate diagnosis of the source of haemorrhage. McGinn and his colleagues (1975), from Southampton, have carried out a prospective comparative trial comparing the accuracy of early endoscopy and radiology. Over a 2-year period, 138 patients were studied and the final diagnosis made in 126. Heading the list were fifty-four examples of duodenal ulceration, twenty-nine gastric ulcers, seven examples of erosive gastritis, thirteen patients with Mallory-Weiss syndrome and eleven with ulcers of stomach or oesophagus in association with hiatus hernia. Interestingly enough, there were only three patients with oesophageal varices. Endoscopy was accurate in 86% and misleading in 3%. The barium meal was accurate in 51% and misleading in 8%. Where the two techniques were combined, 91% had positive identification of the source of haemorrhage enabling diagnosis to be made within 24 hr (often within 12 hr) of admission.

Pagel, Lindkaer-Jensen and Nielsen (1975) note that endoscopy established the diagnosis of Mallory-Weiss syndrome in ten of their eleven patients with this condition; the eleventh case being diagnosed only at laparotomy. In contrast, barium meal studies were negative in all the cases, apart from demonstrating an associated hiatus hernia on one occasion.

Bleeding acute gastric erosions have now become a prominent cause of upper gastro-intestinal bleeding. Physicians, impressed by the fact that these are often small and superficial, tend to regard them as rather benign but it should be noted that most reports indicate a greater than 30% mortality from either continued haemorrhage or from post-operative complications. Himal and his colleagues (1975), from Montreal, analysed eighty-eight cases of acute gastric erosion among 630 patients with upper gastro-intestinal bleeding. Ulcerogenic drugs were responsible for the lesion in twenty-eight patients, thirty-six were associated with surgery and sepsis, ten with a debilitating illness, six with trauma and eight had unknown aetiology. Of thirty patients submitted to barium meal studies, only five were diagnosed accurately but of fifty patients submitted to gastroscopy, the correct diagnosis was made in forty-seven cases.

Conservative management was effective in the treatment of bleeding gastric erosions due to ulcerogenic drugs; only three patients came to surgery and there was only one death in this group. Haemorrhage following surgical sepsis was a much more serious problem and eleven of these thirty-six patients died. These authors advise gastric cooling using the Swenko cooling machine employing a balloon placed in the stomach and continued for 48 hr if an

initial period of conservative management fails to arrest the haemorrhage. This technique was used in twenty-six of the eighty-eight cases and in twenty-two it was successful in arresting the haemorrhage. It was particularly effective in erosions associated with surgery and sepsis; in nineteen cases thus treated, cessation of haemorrhage was produced in sixteen. The overall mortality for the whole series was 20.5%. Of eleven patients who came to surgery because of continued haemorrhage six patients died (54.5%). The authors conclude that surgery has little place to play in the treatment of acute gastric erosions and that emphasis should be placed on conservative management and gastric cooling. It would be true to say that in this country most surgeons would advise exploration of any patient who continues to bleed or where bleeding recurs in a patient with gastric erosion under effective conservative treatment.

One advantage of being a surgeon in this country is the rarity with which he has to face the problem of haematemesis due to oesophageal varices. They probably account for about 5% of upper gastrointestinal haemorrhage in the United Kingdom in contrast with figures up to 50% in parts of the U.S.A. The problem is not only the fact that haemorrhage is difficult to control in this situation but also that the patient is often gravely and even irreversibly ill with severe liver impairment. Kirby, Burke and Jones (1975) report a 23-year experience of 160 patients treated surgically for portal hypertension in Newcastle. About 70% of patients with haemorrhage from this source responded to conservative management. Blood loss of more than 10 units, repeated severe haemorrhage or a single massive bleed requiring a Sengstaken tube for control were the indications for operation. The authors now recommend (and have practised since 1962) a transthoracic approach. The oesophagus is mobilized, the muscular coat incised longitudinally and the mucosal tube freed and transected as low down as possible, then resutured with a continuous silk stitch, thereby occluding the varices. The oesophageal wall is then sutured. Of fifty-four patients thus treated, twelve died in the post-operative period (22.2%). The 1-year survival was 50%. Only four of thirty-three cirrhotics surviving operation eventually had a portacaval shunt and this was confined only to those patients whose general condition was good. Recently Miller (1975) has noted that it is possible to carry out ligation of the oesophageal varices by the abdominal approach, mobilizing the oesophagus in the hiatus and drawing it down to the abdominal cavity. He reports two cases treated successfully by this simplified technique.

Webster (1975), of Pittsburgh, favours conservative treatment wherever possible. Continued bleeding may be controlled by direct intra-arterial perfusion of

vasopressin (pitressin) via a catheter positioned in the superior mesenteric artery which can be continued for 24 hr and maintained intermittently thereafter. If non-operative procedures fail, he prefers portal decompression and does not advise variceal ligation. He is also reluctant to operate on patients with jaundice, low serum albumin, poorly controlled ascites, in coma and in poor nutrition and it is everyone's experience that the mortality in this type of case—whatever one does—is frightful.

Biliary disease

The considerable recent interest in the aetiology and management of stones in the biliary tract continues. Mackay (1975) has reviewed current thoughts on the relationship between bile salts and gall stone disease. Bile salts play an important part in maintaining cholesterol in aqueous solution in bile and there is evidence that, in at least some patients, gall stones arise as a result of bile salt deficiency. Many patients with cholesterol stones secrete hepatic bile which is super-saturated at the time of stone formation. There is a correlation between the prevalence of gall stone disease and the degree of saturation of gall bladder bile in different ethnic groups; young North American Indian females, who have a high prevalence of cholesterol stones, also have a high percentage of cholesterol saturation in bile, whereas the African Masai have a much lower percentage of saturation and cholesterol gall stones have not been reported in this race. Animals which do not form gall stones spontaneously (the dog and the pig) secrete bile containing little cholesterol relative to bile salt and phospholipid. However, hamsters secrete bile with a relatively high proportion of cholesterol and can be induced to form stones readily by dietary manipulation. Baboons secrete bile approaching the limits of cholesterol solubility and form stones spontaneously. There is also evidence of a reduced bile salt pool in gall stone patients and there is an increased risk of stone formation in individuals who have undergone resection of the ileum and in whom the bile pool is reduced.

It was first shown at the Mayo Clinic in 1971 that the oral administration of the bile acid, chenodeoxycholic acid, to patients with radiolucent gall stones in functioning gall bladders could result in a decrease in gall stone size or number.

Iser and his colleagues (1975) report on their experience of treating seventy patients with chenodeoxycholic acid for gall stones over a 3½-year-period. They had no success in eleven patients with radio-opaque stones nor in a further seven cases with non-functioning gall bladders. Of twenty-five patients treated for 6 months or more with radiolucent stones, they found that ten had completely and six had partially dissolved but in nine there was no

change. They formed the tentative conclusion that treatment should be confined to radiolucent stones in a functioning gall bladder. Dosage should be related to weight and they suggest from 14 to 15 mg/kg/day. Response should be confirmed by analysis of bile lipid 1-3 months after the start of treatment; if treatment has resulted in an unsaturated bile, then small radiolucent gall stones (under 5 mm) should show partial or complete dissolution within 12 months, and larger stones should give evidence of dissolving within 2 years. Failure to do so in patients continuing to take regular treatment should raise questions about the type of gall stone present and the advisability of further medical treatment.

The role of this treatment is still to be assessed; there are the possibilities of liver damage, the risk of cholesterol retention and an increase in atheroma formation. Moreover, stones may recur if the treatment is discontinued and Mackay (1975) notes that this has already taken place in two of five patients in whom treatment had been withdrawn for 1 year. It may be that the most useful role of bile salts may be in their infusion through a T-tube placed in the common bile duct when retained stones are found after cholecystectomy. There is need for a controlled trial in its use and also a combination of heparin and bile salts for common duct infusion merits further investigation.

Britton and his colleagues (1975) note that retained stones in the common bile duct may complicate over 2% of biliary tract operations. They describe their technique of infusion of sodium cholate by drip via a catheter threaded along the T-tube in the management of retained stones. The drip was continued for up to 12 days with check cholangiograms every 4 days. Treatment was complicated by diarrhoea (mitigated with cholestyramine) and vomiting (treated with metaclopramide) but four of seven patients had their stones cleared within 8-12 days. Recently there has been much interest in the use of the Burhenne catheter, which can be passed down the fistula track after removal of the T-tube and manipulated into the common bile duct under X-ray control. A wire snare is then used to catch and remove the stone. In the hands of these authors, the catheter was unsuccessful in three out of four patients. They point out that the use of sodium cholate infusion is simple and needs little expertise apart from the ability to manage its side effects. The successful use of the Burhenne catheter, however, requires considerable practice and skill and they comment that this instrument might perhaps be reserved for centres with particular interest in its use.

Management of acute cholecystitis

There is still controversy as to whether a patient admitted to hospital with an attack of acute chole-

cystitis should be managed conservatively or by emergency surgery. Most patients in this country are put to bed, given analgesics and a drip and, in many hospitals, put on to broad spectrum antibiotics. Emergency exploration is carried out if the diagnosis is in doubt or if progressive symptoms suggest the danger of imminent perforation of the gall bladder, which is not a common complication. After the attack has resolved, the patient will be investigated, and, if the diagnosis is confirmed, an elective cholecystectomy advised after 2 or 3 months. Others, and this is particularly so in the U.S.A., argue cogently that early acute surgery is advisable (Leading Article, 1975a). A controlled clinical trial has now been initiated in Liverpool which compares the two methods of treatment (McArthur and colleagues, 1975a, b). A total of thirty-two patients have been studied, seventeen managed conservatively and fifteen by early surgery. In the conservative group, there were two misdiagnoses (a perforated duodenal ulcer and a carcinoma of the colon invading the gall bladder) and three further patients required urgent operation because of failed medical treatment. Of the fifteen patients treated by early surgery, one was a misdiagnosis (acute pancreatitis) and two had technically difficult operations. There was no mortality in the whole series. The conservative group, however, spent an average of 11 more days in hospital.

The authors conclude that early surgery means less time in hospital and the avoidance of the complications of failed conservative treatment without any added risk of morbidity or mortality. Obviously, larger numbers will be required for firm conclusions to be drawn, but two important points will need to be considered; first, the study excludes patients with jaundice, with symptoms of more than 7 days, with evidence of intercurrent disease and who are older than 80 years, but more and more such cases are presenting in our ageing society. Second, the emergency operations were performed by highly skilled teams in two leading hospitals, and pre-operative and operative cholangiography was available. In more and more hospitals in the United Kingdom these luxuries no longer obtain and under such unsatisfactory circumstances, conservatism would appear to be the safer approach.

Without adequate emergency laboratory studies, the diagnosis of acute cholecystitis is, in fact, far from simple. Halasz (1975) studied 238 patients admitted with a clinical diagnosis of acute cholecystitis in San Diego. This was confirmed in 191 patients. Fifty-two underwent emergency surgery. Of the forty-seven found to have conditions other than cholecystitis (20%), five underwent emergency exploration with misdiagnosis, representing 9% of the total of fifty-seven cases having early surgery. Of the

forty-seven misdiagnoses, no less than eighteen had pain originating in the right kidney and ureter and four of these had perfectly normal urine. Twelve patients had hepatic disease, ten had pancreatitis (seven with a normal serum amylase), five had appendicitis and two had thoracic inflammatory disease. There were no diagnostic errors in the 104 patients who underwent elective cholecystectomy and a further thirty-five patients were not submitted to operation even though the diagnosis of biliary disease was subsequently confirmed by radiography. Halasz advises emergency intravenous pyelography in acute right upper quadrant pain because of the difficulty of excluding renal disease and advocates interval operation in order to minimize the possibilities of misdiagnosis.

An unusual indication for emergency intervention is the condition of acute emphysematous cholecystitis, which is discussed by Mentzer and his colleagues (1975). This occurs usually in men, is often acalculous, and is associated with diabetes in one third of cases. The offending organisms are usually *Clostridium welchii*, *Escherichia coli*, or the two in combination. Diagnosis is made by the presence of gas in the gall bladder and biliary tree on radiology of the abdomen. The risk of perforation in such cases renders urgent cholecystectomy mandatory.

Surgeons are always delighted when physicians invent a new therapy which obviates the need for an operation. Undoubtedly, therefore, the report by Classen and Safrany (1975) on the endoscopic removal of gall stones must be regarded as one of the most interesting contributions on biliary surgery this year. Using a special high-frequency diathermy knife introduced via a fiberoptic duodenoscope it was possible to incise the roof of the opening of the common bile duct. In thirty-three out of thirty-nine patients with choledocholithiasis the stones passed into the duodenum spontaneously or else were removed endoscopically using the Dormia catheter as a stone extractor. Ampullary stenosis without ductal stones was successfully treated with this method in a further eight out of a series of eleven patients. There was one perforation of the duodenocholedochal junction which was successfully repaired surgically, but this is a small morbidity in what, surgically, represents a group of difficult surgical problems.

Acalculous gall bladder disease

The majority of surgeons are very unhappy to advise cholecystectomy unless the cholecystogram demonstrates either the presence of stones (preferably) or, at least, a non-functioning gall bladder. Although this is a good general working rule, there is little doubt that some patients are allowed to suffer

from classical attacks of biliary pain because the cholecystogram is reported as normal. Reid and Rogers (1975) report seventeen such patients, all of whom had typical severe and recurrent biliary colic, a normal cholecystogram on at least one occasion and complete relief of their pain after cholecystectomy. These were collected over a period of 10 years and represent about 3% of the cholecystectomies performed. At operation small stones measuring 2–3 mm in diameter, not more than three in number, were recovered from nine patients, one had biliary mud and the rest were free from stones. The gross appearance of the gall bladder at operation was usually within normal limits and histological appearances varied from minimal to mild cholecystitis. Following surgery, freedom from attacks of pain was immediate and complete in all the patients over periods ranging from 6 to 10 years. The patients without stone might well have been manufacturing calculi which had migrated down the biliary tree and have been expelled, and indeed three of these gave a history of jaundice. The authors advise in such cases that a period of observation of months or even years may enable the clinician to become convinced of the organic nature of his patient's symptoms and the need for operation. Ram and Midha (1975) point out that the condition of adenomyomatosis of the gall bladder may produce symptoms identical with those of cholecystitis apart from jaundice which may, however, occur if there are associated stones. Histologically this condition is characterized by thickening of the muscle wall, hyperplasia of the epithelium and intramural diverticulosis. The diverticulum may protrude through the muscularis into the subserosa and may communicate with dilated Rokitsky-Aschoff sinuses, the larger of which may contain biliary concretions. They reviewed twenty-seven examples of this condition; eleven of these were generalized, fifteen confined to the fundus and one to the neck. In fourteen patients there were associated gall stones. The cholecystogram may appear normal but careful inspection of the post-evacuation film reveals the mucosal diverticula, which become filled with the contrast material. Because of the absence of stones, these patients may be labelled functional, but the authors point out that the symptoms are completely relieved by cholecystectomy.

Another radiographically normally functioning bladder which may produce symptoms is the ptosed or floating gall bladder, which instead of being plastered firmly against its bed in the liver, is suspended from it by a mesentery, which is either complete or else surrounds the fundus and body. In rare cases the gall bladder is completely invested in peritoneum and has no mesentery whatsoever and there has been one example where such a gall bladder

herniated through the foramen of Winslow. Ptosis of the gall bladder occurs in some 5% of individuals and its importance is that it allows torsion of the gall bladder to occur with consequent gangrene of the organ (Leading Article, 1975b). Chiavarini, Chang and Westerfield (1975) report an unusual example of a hyper-mobile gall bladder and liver. This was in a 22-year-old male who gave a history of almost daily episodes of abdominal pain dating back to early childhood with intermittent jaundice. At operation the liver was found to be suspended only by the falciform ligament and the entire colon was also quite mobile on the mesentery. It was believed that recurrent torsion of the common duct explained the intermittent jaundice. Visceropexy completely relieved the symptoms of pain and intermittent jaundice.

Acute acalculous cholecystitis may occur after major surgery, burns, trauma and other acute illnesses. The diagnosis in these situations is difficult, and, therefore, is delayed, with consequent increased morbidity. This delay is even more likely in children because cholecystitis is a rarity in this age group. Ternberg and Keating (1975) report seventy-four cases of acalculous cholecystitis in children between the age of 1 month and 15 years; seven of these were personal cases and sixty-seven were collected from previous reports. In forty-five instances the cholecystitis was a complication of another illness. The primary illnesses were leptospirosis, diarrhoea and severe burns. Abdominal pain and an abdominal mass were present in all instances. Jaundice was present in 30% of the children with a preceding illness but in only one child without a separate primary illness. The authors consider that the cystitis represents part of a generalized bacterial invasion and so the infected gall bladder represents merely an undrained abscess. For this reason they advise that drainage by tube cholecystostomy is probably adequate treatment for this entity and elective cholecystectomy can be reserved for the infrequent case in which some biliary tract anomaly or obstruction is demonstrated. It is important that the diagnosis of acalculous cholecystitis should be considered when a child with a preceding severe illness develops an acute abdominal pain.

Cancer of the gall bladder

Carcinoma of the gall bladder, with its unsavoury reputation for frequent inoperability and high mortality, is fortunately uncommon. However, when it does occur, it has a strong association with the presence of gall stones. From Delhi, for example, Prakash, Sharma and Pandit (1975) recently report on 100 examples, forty of whom had gall stones. This was probably an underestimate because in some patients biopsy diagnosis only was made. Moossa

and his colleagues (1975) record published reports of between 54 and 100% association between cholelithiasis and cancer of the gall bladder. In their own series of eighty-two cases, sixty-one (75%) had concomitant stones. Donaldson and Busuttil (1975) present a detailed clinico-pathological account of sixty-eight examples of gall bladder carcinoma. Gall stones were present in forty-seven (70%). Six cases were diagnosed at autopsy; fifty-one had symptoms and signs suggesting an acute or chronic cholecystitis and eighteen were also jaundiced. Eight had painless jaundice and three presented with generalized abdominal pain. Twenty-six of the patients had a palpable mass in the right upper abdomen. Gall stones predispose to recurrent bacterial cholecystitis, often due to coliform organisms. These bacteria have been shown capable of degradation of bile salts to carcinogenic agents within the large bowel and these organisms may possibly play a similar role within the gall bladder.

Sepsis in biliary surgery

It is well recognized that infection is particularly likely to follow cholecystectomy, especially when this operation is performed in the face of obstructive jaundice, in elderly subjects and in those with acute cholecystitis. Keighley and his colleagues (1975) report a controlled trial of patients undergoing gall bladder surgery who were randomized between those receiving gentamicin commenced immediately before operation and continued for 5 days post-operatively and those who were initially untreated and only given antibiotics if there was evidence of post-operative infection. There were forty-nine in the treated and forty-eight in the control group. Bacteria (particularly *E. coli*, *Klebsiella*, and *Streptococcus faecalis*) were cultured in the bile of twelve (25%) of the treated and twenty (42%) of the controls. Wound sepsis occurred in 6% of the treated patients and 21% of the control group and bacteraemia was found in one of the treated and five of the control patients. One of the latter developed toxæmia and renal failure and was the only death in the whole series.

Advanced abdominal cancer

Invasion of adjacent structures by a cancer is frequently synonymous with inoperability, but experienced abdominal surgeons will all quote examples where radical excision of the tumour and the adjacent invaded viscera has been followed not only by relief of severe symptoms but also, in an appreciable number of cases, by remarkable and encouraging long term survivals. Karakowsis, Elias and Douglass (1975) discuss replacement of extensive excision of full thickness of chest or abdominal wall as part of extensive cancer ablation. The defect is

replaced by polypropylene mesh (Marlex). Skin cover is obtained either by mobilizing skin flaps or, if this is not possible, allowing granulations to form through the interstices of the mesh, which is then covered by split skin grafts. We have reported (Davies and Ellis, 1975a, b) twenty-four patients with locally advanced cancer of the large bowel invading adjacent organs treated by radical en bloc resection. This might include removal of portions of bladder, small bowel, pelvic organs, kidney, stomach, etc. Eleven of these patients have died, with a mean survival of 21 months (range 8–44 months) and thirteen are still alive, with a mean survival of 63 months and a range of 12–101 months. The type of organ involved did not affect prognosis, and long term survivors were noted with radical resections of tumours affecting stomach, duodenum, bladder, uterus and abdominal wall.

Turning now to the situation where the patient is beyond surgical cure, the present philosophy is that the best palliation is obtained if the primary growth can be removed, even though involved lymph nodes or more distant metastases are left behind (Stern *et al.*, 1975). Inberg and his colleagues (1975), from Finland, review some 2500 cases of gastric carcinoma treated over a 27-year period. They note that in their country the incidence of this disease is particularly high and ranks with Japan, Chile and Iceland for this unenviable record. During the period of their investigation, the tendency has been increasingly towards an attempt at palliative resection wherever possible and they note a 12.6% 3-year survival figure after palliative sub-total gastrectomy. It is a common surgical experience that gastro-jejunostomy often provides a relatively poor palliation for an advanced obstructing lesion at the pylorus and that resection, if this is at all possible, gives a superior quality of life in addition to a better chance of longer survival. At the cardia, an unresectable growth may be bypassed, but this involves an extensive thoraco-abdominal operation and most surgeons under these circumstances rely on intubation.

When further symptoms develop after radical resection of a gastric cancer, the prognosis seems very gloomy indeed, but this is not invariably so. We have recently reviewed a group of twenty-three patients at Westminster Hospital with this situation (Ellis and Jayasekara, 1975) who were submitted to a 'second look' laparotomy. Three were found to have hopeless dissemination, ten had palliative procedures performed which relieved their dysphagia, vomiting or jaundice, four had recurrences resected and one had a second primary of the gastric stump excised. No less than six were found to have altogether benign lesions and two of these remained well 2 and 4 years after surgery.

Re-exploration in patients with suspected re-

currences after resections of colorectal cancers are even more encouraging (Ellis, 1975). In a total of forty-two patients, no less than four were found to have non-malignant conditions, three had second non-bowel cancers resected, eleven had meta-chronous cancers removed, sixteen had local or distant recurrences removed, four had short circuits and only four were found to be completely beyond any surgical help. Of these forty-two patients, twelve achieved good results, surviving a minimum of 3 years from the second operation, and three were well in periods less than 3 years following surgery. Cleary, Kazarian and Mersheimer (1975) point out that the average time of appearance of a second, meta-chronous, primary tumour in the large bowel is 7 years from the time of the first resection, so that indefinite follow-up and continued vigilance is called for in these patients.

More unusual examples of 'second look' procedures are reports of resections of secondary carcinoma of the thyroid gland, one originating in utero, the other in the colon (Thomson *et al.*, 1975) and of a recurrent perinephric xanthogranuloma (Pigott, 1975); the latter operation involved en bloc removal of the tumour with kidney, ascending colon, a portion of the right lobe of the liver, fundus of the gall bladder and partial resection of the anterior abdominal wall. This patient remains well 18 months after surgery. These reports of rather dramatic surgery all encourage a more aggressive and optimistic approach in what at first seems a very pessimistic situation.

Where direct surgical help is out of the question, there still remain possible lines of more palliative assistance. Pollock (1975) describes the management of nine patients with resistant malignant ascites and one with pleural effusion using a Holter valve to drain the malignant effusion via the axillary vein into the right atrium, in the same way that a congenital hydrocephalus is managed. Backhouse and Howard (1975) detail twelve patients with local recurrences, incomplete resection or fungating tumours of the bowel, all of whom obtained worthwhile remissions from radiotherapy. Catterall and her colleagues (1975), at Hammersmith, report excellent regression in thirty-nine patients with advanced gastric cancer treated by fast neutrons on the MRC cyclotron. They suggest that there may be a place in future for a combination of fast neutron therapy followed by total gastrectomy in these extremely grave cases. Only three of the standard cytotoxic drugs appear to exhibit activity of clinical significance in disseminated gastro-intestinal cancer. These are 5-fluorouracil, mitomycin and bis-chloronitrosourea (BCNU); the combination of 5-fluorouracil and BCNU seems promising but more studies need to be made not only with newly available drugs but with the

numerous agents already available and known to be active against other solid tumours (Leading Article, 1975).

Bladder stone

Cutting for the stone may safely claim to be the most ancient operation undertaken for a specific surgical pathology; indeed, its history is so fascinating that it inspired the author some time ago to give up a good deal of his leisure in producing a little book on this topic (Ellis, 1969). One of the mysteries surrounding this subject is the frequency of bladder stone throughout medical history and its comparative rarity in Europe today. Old surgical writings stressed the large numbers of victims of the stone, especially in children, and indeed a common cause of crying in infants at night which was listed in the old text books was stone in the bladder. It is possible that the high incidence of stone in adults in the past was due to untreated or badly treated urinary obstruction from stricture and prostatic hypertrophy, but this would not account for the epidemic proportions of the disease among children in former times and it may be that some dietary factor, not fully understood, might be to blame.

Smith and O'Flynn (1975) have reviewed 652 patients with vesical stone treated at the Meath Hospital, Dublin, between 1952 and 1972. These patients accounted for only 1.5% of all urological admissions. Only five were below the age of 10 (the youngest being 18 months) and 80% were over the age of 50. Although eighty-eight were associated with renal stones, only 3% gave a history of ureteric colic, suggesting that the bladder stone had descended from the kidney, so that it appears that the great majority probably originated in the bladder itself. Male patients accounted for 92% of the cases and the small number of female patients either had retained suture material as a nidus for stone or else had a neuropathic bladder. Two-thirds of the men had bladder outlet obstruction and it is interesting that only five patients in the whole series were found to have parathyroid adenoma or hyperplasia, although only 179 were actually screened for serum calcium levels.

A stone will form around any unabsorbable material placed within the urinary tract and, as the variety of such substances used by surgeons increases, so the catalogue of unusual niduses increases. Dongaonkar (1975) records a lady who had a mersilene mesh inserted as a sling around the urethra for stress incontinence. Three years later, a stone was removed from her bladder which was found to be hanging from its anterior wall by two mersilene slings.

The great majority of bladder stones today are removed by open operation but in recent years there

has been much interest in the development of the electronic lithoclast, in which the stone is broken up by a series of powerful electrical discharges delivered through a modified cystoscope held close against the calculus. Up to ten or twenty shocks may be required to disintegrate the stone, which is then removed by irrigation and its complete removal checked by cystoscopic examination (Leading Article, 1975).

Hydradenitis suppurativa*

Hydradenitis suppurativa is a chronic inflammation of the apocrine glands of the skin. These are found in the axilla, the ano-genital region, the external auditory meatus and around the areola of the breast. They may also be distributed in small irregular areas on the scalp, face and trunk. They produce a turbid, milky secretion by breakdown of the cuboidal cells which line their tubules and which discharge into a hair follicle. This secretion is turbid and milky, and bacterial decomposition of its organic content gives it a characteristic offensive odour. Unlike the eccrine sweat glands, which are distributed over the entire surface of the skin and produce a watery secretion which commences at birth, the apocrine glands begin to function only at puberty (Ellis, 1975). The apocrine glands are more numerous in black people and chronic infection is commoner in this race. The reasons for the development of chronic infection in these glands is not fully understood. It may be predisposed to by poor hygiene, irritation from clothing, close shaving or plucking of hair, deodorants or blockage of the ducts by keratinous material which leads to infection. The appearance of the well established condition is quite characteristic. The affected area is honeycombed with sinus tracts and multiple abscesses and the skin is thrown into cord-like elevated folds.

The condition causes considerable disability and is surprisingly often misdiagnosed as being simply due to recurrent boils. Most patients reach surgery only after many years of suffering and often after multiple courses of antibiotics. The established disease can only be effectively treated by wide excision of the involved apocrine area. Anderson and Perry (1975) reviewed twenty-six patients whom they treated with axillary involvement. The age range was from 18 to 56 years and they point out that the condition cannot start before puberty, at which time the apocrine glands become activated. Twenty of their patients were obese and three had diabetes. It was interesting that the pre-operative duration of the condition before surgery ranged from 1 to 18 years with an

* The accepted spelling is *hydradenitis* but of course *hydr-* or ἵδρως is sweat and *hydr-* or ὕδωρ, ὕδρ- is water. To be correct we should use *hidradenitis*, but to conform to common practice we have used *hydradenitis*.

average of 5 years and all had had previous conservative treatment. Satisfactory results were achieved by excising the whole of the axillary hair-bearing area with primary skin closure under antibiotic cover. Hartwell (1975) advises free skin grafts rather than flaps where very wide sacrifice of skin is required. He points out that treatment calls for bold resection of all diseased tissue and staged procedures may be needed for complete removal. Loss of blood may be quite marked when excising large areas of hydradenitis in the perineal and gluteal regions and transfusion may be required; he points out that 'extensive disease consists of a labyrinth of septic granulation, fibrosis and draining sinuses that must be removed'. A skin graft may be applied at once or may be delayed for one or two days during which time the raw area is soaked in a solution of neomycin. Hartwell advises that the grafts be sutured to the bed of the defect in order to eliminate bulky post-operative dressings.

We have described (Pigott and Ellis, 1975) nine patients suffering from hydradenitis suppurativa, six affecting axillae, one the groin, one both groin and axilla, and one the perineum. All were treated surgically with satisfactory healing either following primary suture or, with more extensive disease, following split skin grafts. Large areas of axillary skin excision may give rise to contractures which can be avoided either by the use of a split skin graft, rotational skin flaps or Z-plasty. In these nine patients, eight had been previously misdiagnosed and treated with repeated unsuccessful courses of antibiotics and even local radiotherapy. The last patient in the series had had the disease only for 1 month, having been correctly diagnosed by our casualty officer and referred without delay for surgical excision.

There is no doubt that clinical awareness of this easily recognized syndrome would lead to a considerable alleviation of the suffering of these usually otherwise healthy, active young adults.

Miscellanea

Among the interesting assortment of publications in 1975 a number particularly caught the eye of the reviewer. Ohlsen, Skoog and Sohn (1975), from the University of Uppsala, have carried out interesting experiments on the pathogenesis of cauliflower ear. They demonstrated in the rabbit that blood injected between the skin and perichondrium of the ear was absorbed. However, if the blood was injected deep to the perichondrium, then the haematoma was invaded by chondroblasts within 2 weeks, and over a 4-week period there was a gradual change into mature cartilage. Cartilage itself has no regenerative capacity and so the old concept that this condition is produced by proliferation of the damaged cartilage itself has no

foundation. These authors advise that treatment should comprise evacuation of the haematoma and stripping of the perichondrium in the acute phase to prevent new cartilage formation.

The introduction of each new drug brings with it almost inevitable iatrogenic problems. Spira and his colleagues (1975) report five cases of drug addiction placed on methadone who presented with a picture of acute intestinal obstruction and were admitted to surgery. They were, in fact, cases of paralytic ileus with faecal impaction due to the methadone, which these authors state is a hitherto unreported complication. This paper will obviously be a warning to physicians using methadone on this group of patients where acute abdominal symptoms are notoriously difficult to sort out.

Pneumatosis coli is an uncommon condition of unknown aetiology characterized by multiple gas-filled cysts in the submucosa of the colon. Most patients are middle-aged and present with mucous diarrhoea and excessive flatus. The cysts contain variable proportions of nitrogen, carbon dioxide, hydrogen and oxygen. Prolonged breathing with high concentration of oxygen alters the balance of diffusion of gases between the cyst and the surrounding tissues in favour of absorption. Down and Castleden (1975) report the third recorded case in which complete resorption of the gas cysts was effected by 6 days of almost continuous treatment with humidified oxygen delivered both by mask and via nasal catheters. These authors suggest that the cysts might be created and maintained by a fastidious anaerobic gas-forming organism which produces gas at a rate which exceeds the rate of absorption until an equilibrium is reached. The high tissue concentration of oxygen achieved with oxygen therapy might kill these organisms and the gas is then reabsorbed in the same way as gas contained within any natural or artificially created spaces in the body; hence, the cysts should not recur.

Strokes represent a major cause of death and disability. Surgical prevention of cerebral infarction at present depends on disobliteration of partial blocks in the extracranial arteries to the brain and more recently the use of microsurgical techniques that bring additional blood to the brain by way of superficial temporal or occipital arteries anastomosed to the middle cerebral artery. Goldsmith, Duckett and Chen (1975a) describe a fascinating series of experiments in which they showed that a pedicled graft of omentum placed upon the brain in the dog can prevent cerebral infarction. Three groups of dogs underwent total occlusion of the right middle cerebral artery. Dogs that had omentum placed on the brain before occlusion withstood this deprivation of normal cerebral blood flow in a statistically significant manner when compared with dogs that

had no omental protection or had the omental graft placed on the brain simultaneously with the middle cerebral arterial occlusion. These results raise the possibility that a graft of the omentum might be a technique for revascularization of the brain in patients with transient cerebral ischaemic attacks or brain dysfunction secondary to diminished cerebral blood flow who presently are not candidates for routine surgical procedures for cerebral revascularization. Even more exciting experimental findings concerning spinal cord vascularization have been reported by the same team (Goldsmith *et al.*, 1975b) who were able to demonstrate that vascular connections can develop between the normal spinal cord and a pedicle of omentum in the animal model. In an astonishing experiment carried out by this group in November, 1974, an adult female cat had the spinal cord completely transected in the mid-thoracic region which was followed by onlaying of the intact omentum on the transected site. The hind limbs of the cat were completely paralysed for 1 month but shortly after this she began to stand and by February, 1975, she could walk short distances. This experiment is now being repeated on a larger series of animals and obviously the results will be awaited with considerable interest.

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