The Old Order Changeth

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The long-held belief that advances in surgery are accelerated by experience in war hardly applies to the thirty nine years since World War II came to an end. Progress in virtually all aspects has been dramatic and technological advances so great that the surgeon of today belongs to a new generation of men with surgery a science much more than a craft — reminiscent of the same claim made on John Hunter's behalf in the Eighteenth Century.

True it is that experience over the years in Northern Ireland and latterly the Falklands has been matched by lessons learnt by our colleagues from other lands in Korea and Vietnam and how fortunate we are that consultation and communication have so far improved that the lessons learned can be shared so quickly. But it remains a truism that military surgery by its nature is as challenging as ever, with judgement and power of decision at a premium and ancillary aids to diagnosis of necessity very limited indeed.

There is, however, the ever present war on the roads which equates civilian with military casualties and provides the equivalent of apprentice training for some of us. In 1916 one of the two Director Generals of the Army Medical Services, Sir Alfred Keogh, wrote, in an editorial in the British Journal of Surgery "We can remember periods of excitement when dogmatic assertions as to this or that method of treatment seemed to indicate that, after all, we were not so very far from the age of empiricism". But all that has vanished with the era of antibiotics, isotopes, computers and scanning — to mention but a few of the landmarks in surgery as it has evolved in modern times. Nuclear medicine indeed matches the age of the satellite and open heart surgery and transplantation, to cite but two examples, should convince the die-hard not that the Old Order Changeth but that it has vanished almost without trace.

War Wounds

It is beyond my capability, I am afraid, to describe the astonishing advances in fracture fixation and management, notably by the O.S. and Mueller compression techniques from Switzerland that have improved the results of treating limb injuries so impressively, but wounds of the abdomen and thoraco-abdominal wounds in particular are closer to my heart.

The time factor is vital and it is generally accepted that a delay in treatment of more than three hours will allow bacteria to proliferate to a level that results in the develop-

ment of infection. The velocity of the missile is likewise important, the "low velocity" missile at speeds up to 300 metres/second producing a deep, narrow track and the "high velocity" projectile at speeds greater than 2000 metres/second a much more extensive wound, whose size may even be difficult to ascertain until four or more days after injury. If I incline to a cautious approach to the 4-quadrant diagnostic paracentesis in the assessment of abdominal injury it is only because it may at times delay definitive action: and definitive action is of the essence in dealing with abdominal injuries.

A comparison with road traffic and other civilian injuries is worthwhile in this respect and the shorter interval between injury and operation may permit a different approach. This is best illustrated in wounds of the colon and rectum of which Ogilvie wrote in 1942 "The treatment of colon injuries is based on the known insecurity of suture and the dangers of leakage. Injured segments of colon must either be exteriorised or functionally excluded by a proximal colostomy — by the surgeon with less optimism and more sense than the one tempted to primary closure with or without resection". Walt indeed has recorded good results from selective primary repair in cases coming to operation early as a result of rapid transport and improved resuscitation in civilian surroundings. Advocates of this method of treatment do not regard it as advisable if more than six hours have elapsed between injury and operation, with extensive peritoneal contamination, hypovolaemic shock and a blood pressure less than 80/50 for thirty minutes, concomitant solid viscus injury — certainly of two viscera — or in patients over sixty. It may not represent a high proportion of the total. Exteriorisation of the sutured bowel is likewise a compromise.

I cannot leave the subject of abdominal injury without reference to wounds of the liver and the place of conservatism in right-sided thoraco-abdominal wounds. The adhesive spray was used to some purpose by the Americans in Vietnam and there is general antipathy to packing in any form. Suture and resection are of course the alternatives but the pack must still have an occasional place, if only to allow the patient to be transferred to a centre better adapted to more radical exploration. Systemic antibiotics must be given in large doses to minimise the risk of septicaemia.

Trends in the surgery of civilian trauma towards suture of splenic injuries rather than splenectomy are also worthy of comment but I have no personal experience

Shock

I turn now to the difficult question of shock, where study at cellular level and notably of cellular membrane injury has led to considerable advances. A better understanding of the relative merits of crystalloids and colloids, the objections to plasma and plasma-expanders and the proper place of blood — and indeed substitutes such as Haemaccel — in resuscitation is self-explanatory but the intensive care unit has been the greatest advance in fifty years. It is not for me to assess the debt we owe to anaesthetists in this connection nor to field transfusion units, which were invaluable in the Second World War and advances in anaesthesia today have to be seen to be believed — a far cry from 1938, when I saw three categories of anaesthesia only in a large hospital in a European capital: (1) heavy premedication, a leather harness and a rosary; (2) local or regional anaesthesia; and (3) a volatile inhalation anaesthetic for those who could afford it.

The understanding of acute respiratory failure, perhaps due to endotoxaemia in as many as 70% of cases, is an example of progress in this field, with endotracheal intubation and volume-cycled ventilators contributing materially to the management. They help to avoid the use of high concentrations of oxygen or high inspired pressures, which carry risks. The depression of cardiac performance in acute respiratory failure due to thromboxanes and other prostaglandins may be treated by dopamine, or glucose-insulin-potassium as an alternative, and the exhibition of the appropriate antibiotics has rendered this previously almost lethal condition more manageable.

That ileus, wound infection, delayed visceral rupture and jaundice are the most important complications of abdominal wounds goes without saying, but septicaemia, particularly of the Gram negative variety, must never be forgotten and as quickly treated as recognised.

Abdominal wounds apart, the cynic who said that "the eleven most common causes of Emergency Department wound infections are the mouth and ten fingers of the examining physician" had more than a grain of truth in his text.

Ischaemia

Whilst haemorrhage — and subsequently infection — is the problem confronting the military surgeon, his civilian colleague more often deals with ischaemia. Intestinal ischaemia typifies the difficulties but laparoscopy and angiography represent advances in the methods of investigation and intra-arterial papaverine and prostacyclin in the treatment. Low molecular weight dextran may also prove useful as a plasma expander, decreasing sludging in the microcirculation.

Non-occlusive mesenteric ischaemia has a high mortality and is certainly commoner than mesenteric venous thrombosis. Transluminal angioplasty is the alternative

to arterial reconstruction and endarterectomy is always technically difficult — with a by-pass procedure, using a saphenous vein graft, knitted dacron or goretex proving much easier.

Ischaemia in the limbs presents analogous problems and prostacyclin infusions have something to offer. Angioplasty likewise represents a recent advance but I am not qualified to express an opinion in coronary artery disease, where by-pass grafts are so obviously in vogue — to the number of 170,000 in the USA in 1973. Renal ischaemia is another field where recent work, particularly with electromicroprobe analysis to study cellular changes promises much.

Monitoring of blood-flow by Doppler techniques and fluorescein and microvascular surgery with the operating microscope have already improved revascularising methods, notably in extracranial-intracranial by-pass procedures in carotid artery disease and in the enhanced success of free musculo-cutaneous flaps in wounds of severe substance loss.

Angiography

I now turn to angiography in the investigation of intestinal bleeding, where barium studies now have no place in the management of the acute case in the upper gastrointestinal tract. Endoscopy, perhaps with an image intensifier, and radionuclide studies should provide the answer, the latter with technetium labelled red blood cells or sulphur colloid. Arteriography can follow immediately to confirm the bleeding site and control it with vasopressin or embolisation. Vasopressin needs to be infused selectively into the vessel (e.g. left gastric artery) to control bleeding of arteriocapillary origin, as intravenous pitressin will not do so. It tends to be ineffective when there is inflammation at the bleeding site (e.g. pancreas). The high incidence of infarction is the risk of transcatheter embolisation in the mesenteric vascular bed and surgical alternatives (gelatin (gelfoam) polyvinylalcohol and cyanoacrylate and possible alternatives).

Transhepatic obliteration of gastro-oesophageal varices via the coronary vein may be used to prepare a patient for a porto-systemic shunt and embolisation has place in the treatment of some cases of haemobilia. Angiography in the colon may be of use in elucidating bleeding from diverticula, a symptom commoner on the right side than the left — and in demonstrating angiodysplasia, which is probably best treated by right hemicolectomy if giving rise to persistent bleeding. The place of angiography in the late management of solid viscus injury following abdominal trauma is not easy to define but it has its advocates, particularly in the diagnosis of haematoma and closed injury of the liver. Digital subtraction angiography is a remarkable refinement here and in other regions.

Diagnostic Aids

Only a few examples need be quoted of recent im-

provements in diagnostic facilities with C.A.T. scanning and nuclear magnetic resonance being particularly applicable to the head and neck and ultrasound and radionuclides to the abdomen. Indium labelled leucocytes and gallium have a well-defined place in the delineation of pelvic or subphrenic abscesses, as has drainage with a pigtail angiocatheter in their treatment. The use of silicone stents likewise represents a considerable advance in the case of patients with inoperable ureteric or bile duct obstruction.

I could expatiate on the progress resulting from the use of the autoanalyser and the better understanding of electrolyte imbalance: fine needle aspiration and cytological diagnosis by brushings have enhanced methods of biopsy, itself so marvellously facilitated by the development of fiberoptics and flexible endoscopes, notably by the Japanese.

From Kussmaul in 1868, who with an oil lamp and reflector, passed a 24-30 cm hollow tube into a sword-swallower and peered through it, to Hirschowitz in 1958, who introduced flexible endoscopes, is a saga of endeavour and success, so that "through a glass darkly" of a bygone generation has now become a beautifully illuminated reality. The gastro-camera and cine and video are other refinements and mobile endoscopic units in Japan are the modern successors of mobile chest X-ray units, so familiar to us all. This is not the place to dwell on bone scans and isotope scans in general, first exemplified to me in the thyroid, but they get better and more selective as time goes on and who would dare predict their ultimate span?

Finally I only mention staging laparotomy and second look procedures as diagnostic aids to condemn them, as scepticism of their claims always seemed justified and hope, now nearly realised, quite reasonable that they should recede into oblivion.

Postoperative Care

Whilst operative procedures remain basically the same, though the tools improve and new techniques like cryotherapy, the laser and ultrasound machines are being improved it is the better understanding of post-operative care that has shown most advance in recent

years. Enteral feeding with elemental diets, infusion pumps, nutriflex keofeed tubes and the full appreciation of a feeding jejunostomy have made a great contribution. Prophylactic therapy (especially metronidazole, which is effective against anaerobes) and systemic antibiotics therapeutically, and if necessary intraluminally, have come to stay. Total parenteral nutrition likewise has a well defined role to play in preparing patients for major surgical procedures as well as sustaining them afterwards.

Recent advances

I might end by reciting how the clinical relevance of regulatory peptides has opened a new vista of hormones in the intestinal tracts, owing their identification really to improvement in radioimmunoassay and immunochemistry — gastrin, secretin, cholecystokinin (a synonym for pancreozymin) and vasoactive intestinal polypeptide (V.I.P.). Every Fellowship candidate knows about the Zollinger-Ellison syndrome and gastrinoma but I have never seen one (and recognised it!).

I could appraise E.R.C.P. and the choledochoscope or extol recent improvements in the management of obstructive jaundice by investigation with ultrasound, C.A.T. scanning, percutaneous transhepatic cholangiography and E.R.C.P. Endoscopic papillotomy for retained stone is a possible sequel. All these represent relatively new developments on a par, perhaps, with mammography, thermography and diaphonography (trans-illumination) in the breast. The importance of oestrogen receptors has likewise added something but the cause of breast cancer remains an enigma. Chemotherapy and hormones help some of the victims, radiotherapy others, with giant therapeutic advances in its armamentarium, but surgery is clearly only of relatively minor importance.

Could it be otherwise if this is a systemic disease? And who doubts that the etiology will one day be understood, or that mutilation—because all amputations mutilate—will one day be a thing of the past?

Nothing would persuade me to end by predicting the future, a gift vouchsafed only to prophets and physicians. For my part the future will take care of itself. It always has. It always will.

Journals/Publications Received

The following Journals/Publications have been received and are available in the Royal Army Medical College Library.

JOURNALS

Annals of Clinical Research; Archives of Surgery; Australian & New Zealand Journal of Surgery; Annals Chirurgiae et Gynaecologiae; British Medical Journal; Bulletin of the World Health Organization; Boletín de la Oficina Sanitaria Pan-americana; Bulletin of the Pan American Health Organisation; British Journal of Anaesthesia.

Central African Journal of Medicine; City of Durban Annual Report of the City Medical Officer of Health; Egyptian Medical Association, The Journal of; Gazette The (Qaranc); Giornale De Medicina Militare; Hellenic Armed Forces Medical Review; Indian Journal of Medical Research.

Journal of the Royal Society of Medicine; Journal of the Royal Society of Health; Journal of the Australian Medical Association; Journal of the Royal Naval Medical Service.

Lancet; Medicine et Armees; Military Review; Military Medicine; Medical Journal of Australia; Medicine Tropicale; Medical Bulletin of the US Army, Europe; Medicina Militar; National Defense Medical Journal, Tokyo.

Pakistan Armed Forces Medical Journal; Quarterly Journal of Medicine; Revue Internationale Des Services De Sante; Royal Army Pay Corps Journal; Royal Engineers Journal; Revista Sanitaria Militar; Royal Pioneer; Revista Cubana de Medicina Tropical; Revista Del Servicio De Sanidad De Las Fuerzas Armadas; Revista Medica Da Aeronautica De Brasil.

Scottish Medical Journal; South African Medical Journal; Tropical Diseases Bulletin; Transactions & Studies of the College of Physicians of Philadelphia; Ulster Medical Journal; Vivekananda Institute of Medical Sciences-Journal of the; Wehr-Medizinische Monatsschrift; World Health Forum — WHO; WHO Emergency Health Kit; WHO Chronicle;

PUBLICATIONS

As you were VE Day — A Medical Retrospect — BMJ 1984; Biological Substances — WHO Bulletin of the International Civil Defence; Cardiomyopathies; Chemistry and Specification of Pesticides — WHO; Education and Training of Nurse Teachers and Managers with Special Regard to Primary Health Care — WHO; Environmental Health Acrylonitrile — WHO; Environmental Health Styrene — WHO; Environment of Health Criteria — WHO; Evaluation of Certain Food Additives and Contaminants — WHO; Expert Committee on Biological Standardization; Glossary of Terms Used in the "Health for All" Series — WHO; Guidelines for Drinking Water Recommendations — WHO; Health System Support for Primary Health Care — WHO; Information and Health — WHO; International Review of the Army, Navy and Air Force Medical Services — SPEI 1984; Leishmaniasis, The — WHO; Lymphatic Filariasis — WHO; Malaria Control as Part of Primary Health Care — WHO; Medicine—New and Recent Oxford Books — Winter 1984/5; Medicine and Health Care in Developing Countries — WHO; Methods for Cohort Studies of Chronic Airflow Limitation — WHO; Nuclear Power: Accidental Releases—Principles of Public Health Action — WHO; Nutritional Surveillance — WHO; Prevention Methods and Programmes for Communicable Diseases — WHO; Public Papers — The Fresh Approach in Health Care; National Health System; The Use of Health System Reserves; Health Care Faulty Projects in Developing Areas and Planning Implementation and Operation; Recommended Health-Based Occupational Exposure Limits for Respiratory Irritants — WHO; Road Traffic Accidents in Developing Countries — WHO; Role of Food Safety in Health and Development — WHO; Salus: Low Cost Rural Health Care and Health Manpower Training — IDRC; Short Practice Surgery — Bailey & Love; Strategies for the Prevention of Blindness in National Programmes — WHO; Urban Air Pollution — WHO; WHO Emergency Health Kit; WHO Expert Committee on Rabies; WHO Expert Committee on Specifications for Pharmaceutical Preparations.