ANÆSTHESIA IN WAR

BY


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This short communication is submitted with great diffidence since the last anaesthetic personally administered to a battle casualty was on July 22, 1945. No contact with war surgery has been made since. Experience immediately before that made up a total of 4,328 anaesthetics to battle casualties spread over the previous six years. In order to assess those experiences a little history is necessary. In the second Libyan campaign beginning on November 18, 1941, and ending February 6, 1942, the author was working in a mobile surgical team, which travelled from the wire of the Egyptian frontier to Benghasi and retreated back again to El Adem, near Tobruk. 240 operations were performed using thiopentone and oxygen on 146 occasions. Local analgesia was used 8 times and spinals nil. At El Adem took place a small meeting of four anaesthetists attached to teams which had made a similar journey. Between them, 672 operations were performed using thiopentone alone or combined with another drug on 548 occasions.

It was in this campaign that the fatal case with which a gross overdose of thiopentone can be given was well demonstrated, and this is what was written soon after to a friend, "the patient was an Italian P.O.W. with through and through wounds of the right buttock with extensive sloughing and bruising. The general condition was very poor for he had been wounded three days before. While waiting for the operation the patient was noisy and talkative. Many British patients were waiting quietly for operation at the time and after only a superficial examination of his general condition I slipped in morphia 1/4 grain intravenously. Peace amongst the waiting patients was restored; When he was put on the operating table, again he became talkative and emotional, so that I remember thinking I must stop this noise quickly, especially as neither the surgeon nor myself could understand a word he was saying. He was given pentothal 3/4 gramme fairly rapidly. While the wound was being inspected respiration ceased, manual inflation of the lungs with oxygen was promptly begun but no carotid pulsation was visible, and the patient was dead."

Another lesson concerning administration was learnt then and found of value in the succeeding four years. It is best explained in a letter dated February 1942, "a desert battle is full of surprises, which affect the forward medical units, just as much as the combatant troops. The surgical team and
its parent unit seldom have the latest news on the state of the war. In deciding the site for a surgical unit to work, it is difficult for the local commander to say that that particular area may not be visited by some patrolling A.F.V.s. All these facts, together with the established surgical principle of early operation for every battle casualty, makes it of the highest importance to deal with a collection of waiting patients as quickly as possible. 'Get on with the job' was a thought very much present in the minds of all the members of our unit, whether 2 or 22 patients appeared at the theatre door. To help in this idea the anaesthetic service can play a part. First, the surgeons must not have to wait between their cases for a man to be anaesthetized. This means that induction must be rapid, and it should be complete before the outer bandages or clothes are removed. This small point is kind to the patient and allows the surgeon to remove the dressings much quicker than if he was working on a conscious man. Then the operation starts, and although it would be most unusual for the surgeon to take more than one hour over any case yet his operating time must never be limited by any consideration of the anaesthetic method or drug used. The ease of maintenance of anaesthesia after this rapid induction is also very important so that two tables may be kept going continuously for a long operating session."

Ether was the agent used for muscular relaxation often vaporized by some modification of Flagg's can. My own was made from a Cow & Gate Baby food tin with nail holes knocked in the lid. There were several modifications by other workers of this safe, efficient "draw-over" method of vaporizing ether. Chloroform had no place in our plan of anaesthesia either then or later except in one interesting aspect. This was in providing analgesia for the removal of severely wounded men from tanks. The method used was a copy of the well-known chloroform ampoule broken inside a gauze pack used for obstetric analgesia. By experiment at the Base 40 minim of chloroform were placed in each ampoule. These 2 cases were described in a medical friend's diary, who was later killed in a motor accident.

Case 1.—L/Cpl. D. Right leg and thigh almost blown off by bomb, pelvis pulped, perfectly conscious and in great pain even after morphia 1/4 grain given intravenously. Imperative to leave somebody with him until he died or move him on to a stretcher, this latter was done with the aid of chloroform anaesthetic. Rapid easy induction, anaesthesia lasted for 5 to 7 minutes. Died 2 hours later.

Case 2.—Pte. S. In this case chloroform anaesthesia was used while a fragment of shrapnel was removed from the scrotum from which it was protruding and keeping up haemorrhage. In this last case an ampoule of 50 grammes of chloroform from a German first-aid kit was used. This was found to be far more than was required, even with an improvised mask and alfresco conditions.

Later in Italy the author's Field Surgical Unit began its long attachment to the New Zealand Expeditionary Force. This lasted from Taranto in the heel of the country to the canals of Venice in the North. The Unit was attached either to their C.C.S. or to one of their Field Ambulances. Throughout two winters and two summers success and failure were shared in all their aspects. No people in the world could have shown greater friendship to the small surgical
unit attached to them. Their characteristics are indelibly printed in memory, for they showed so clearly what is perhaps the only sensitive quality in war, namely friendship. T. D. M. Stout, late Consultant Surgeon to No. 2 N.Z.E.F., describing abdominal injuries of the New Zealand Division during the Italian campaign found that nearly half of the post-operative deaths occurred in the first twenty-four hours, namely 46 patients out of a total of 102, and in the next twenty-four hours a further 7 deaths occurred.

On May 5, 1944, a small Anaesthesia Conference took place between the Anaesthetists of the U.S. 5th Army and the British 8th Army at the 16th U.S. Evacuation Hospital, Casanova, Italy. Capt. Irving Greenfield, U.S.M.C., read a short paper on “Anaesthesia in Abdominal Surgery Pertaining to War Casualties” in which he stressed the help given by making an intercostal block in the mid-axillary line from the 4th to the 11th dorsal segments using 2 per cent procaine or metycaine. Major K. A. Beecher, Consultant in Anaesthesia and Resuscitation to 5th Army, spoke in Discussion. He warned us of the grave danger of anuria following massive blood transfusion or the over-dosage of sulfa drugs.

Throughout this time ether remained the chief agent for obtaining muscular relaxation. That ingenious and sturdy apparatus known as the Oxford Vapourisor had arrived. For the author this machine proved the most valuable piece of equipment ever received. Even when no ether was needed and continuous $\frac{1}{2}$ per cent thiopentone in normal saline was the sole anaesthetic agent the Vapourisor connected to oxygen was always strapped to the patient. A feeling of complete command of the patient was given by gentle pressure on its inflating bellows. Also some rather amateur controlled respiration was given with this apparatus while a lung was sutured or a thoraco-abdominal injury repaired. One further picture flits across the memory, two large New Zealand Maori soldiers lay in adjacent beds each with a pleural effusion which was aspirated one morning. The supposed local anaesthetic used was in fact the stock bottle of morphine solution and it was soon apparent that each had received an injection of 8 to 10 grains of morphia. Soon artificial respiration was being performed by the aid of the Oxford Vapourisor attached to each patient. Rhythmical inflation continued for some hours with a happy and successful result in each case. The sight of those two bellows being raised up and down by the patients themselves was a fine sight for the devoted ward orderlies.

Now it must be recorded that some workers continued to use the Field Service pattern of the Boyle’s machine, and others obtained their muscular relaxation with heavy doses of thiopentone. This last practice always seemed to be fraught with danger. During an active operating session the anaesthetist should have many responsibilities besides producing efficient and safe anaesthesia. This is especially true if the anaesthetist happens to command the unit in question, and it may here be mentioned that when eight Field Surgical Units were first made in Middle East in early 1942 four were commanded by a surgeon and four by an anaesthetist.
Time passes and the last Italian river is reached. Years before, as far away as Cairo, there had been repeated requests for cyclopropane from many anesthetists. Only a trickle ever arrived until preparations for the battle for this last river crossing were being made. Then quite suddenly all Field Surgical Units were issued with an American Heidbrink Military machine, unlimited cyclopropane and soda lime. What a change this was in very truth from the days of the Cow & Gate ether tin! The patients received from this battle were in much the same condition as those from so many river crossings. These three major cases are taken from the personal diary of the author and show the use of cyclopropane:

"Cpl. B. Wounded, Schu mine, 4 hours Bi-lateral traumatic amputation of both legs above knees. Wound of testicle and left hand. Very ill indeed. Had 2 pints of Plasma, 2 of blood. B.P. 75/? Pentothal 0·1 gramme. Respirations became small, inefficient gasps. Cyclo. and O₂ started, much improved in colour, quiet respirations. No pulse at temples or wrists. B.P. at end of operation 80/60. Awake. Seen in ward ½ hour later, quite rational, warm." The next note is as follows, "yesterday had bilateral t.a. Today acute abdomen, haematuria. B.A. 90/50. Looks fairly fit. Pentothal 0·2 gramme + Cyclo. + a little ether. Hole in bladder and rectum. Colostomy and cystostomy. B.P. at end of opn. 110/60. Coughing. This man returned to full consciousness quickly from his second operation and did not succumb till the fifth post-operative day: Inquiry amongst neighbouring F.S.U.s shows no one else can report a case of survival in a man who has suffered a bilateral traumatic amputation of both legs, and a penetrating wound of the abdomen at the same time.


After that battle an attempt to assess the value of cyclopropane for such work was made, and the following extract from that opinion is quoted here: "after 82 cases it is impossible to be dogmatic, and it would therefore be incorrect to say that cyclopropane was essential for forward surgery. After all, 2,800 other patients in the same campaign have received anaesthetics from me, and few, if any, have suffered irreparable harm, despite the lack of cyclopropane. On the other hand, I believe through this past experience, especially that of the last month, that cyclopropane should be made available whenever asked for in the forward areas."

The Future

The new boundaries of physiology have been pushed further out, yet war teaches us what one can do without. In this connexion it is most earnestly hoped that those who plan the anaesthetic service for war realize that the
present source of natural curare may cease or be inadequate in amount. None of the muscle relaxants, synthetic or natural, are perfect in that all have side-effects. Therefore it is hoped that research workers from many countries will strive to find the chemical compound having a motor blocking effect and nothing else. Such a compound will have immense use for the battle casualty anaesthetist. On the sensory blocking side, several agents, such as intravenous pethidine (Demerol) or thiopentone, will have their place in enormous quantities.

With regard to apparatus, it would appear that present designs in the manufacturer's catalogues could have no place at all in battle. Superb strength in construction and complete simplicity in design should be their keynote and this is not yet apparent. Water's canister with bag attached to two flowmeters of oxygen and nitrous oxide may safely carry the most ill patient through any period of respiratory paralysis brought about by a muscle relaxant.

In a future conflict let it never be forgotten by any of us that once a patient has reached the surgical team his war is over, for the time being; and whether he be friend or foe, black or white, he is some Mother's son, and is deserving of the highest degree of kindly efficiency.