THE SURGERY AT No. 3 GENERAL HOSPITAL

AN ANAESTHETIST'S VIEWPOINT

BY

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No. 3 General Hospital was the first and I believe the only general hospital in France that was entirely a tented one. The whole hospital, including the operating theatre and only excluding the pathology department, was under canvas.

The operating theatre tent was a marquee hospital, extending pattern. It consisted of three sections and two ends. There was an anaesthetic tent and sisters' duty room combined at one end of the theatre and a sterilizing room at the other. At first the floor of the theatre was merely a tarpaulin placed on the ground. This was very uneven, and it was impossible to wheel tables and anaesthetic apparatus about. It was also very cold to stand upon. This floor was superseded by a boarded one. This was better, but the heat of the theatre soon warped the unseasoned wood, and large cracks appeared that allowed the wheels of the tables to fall between them and dust to gather underneath. It would be well if all wheels for theatre equipment for use in the field were at least eight inches in diameter. This would permit them being moved even over rough floors. The last floor was a concrete and cement one covered with rubber linoleum stuck to the cement. This was perfectly satisfactory.

Heating and Lighting

The heating of the theatre was a major problem. We experienced one of the most severe winters known in Northern France for some years. As an instance of this there were actually ice floes in the tidal part of the harbour at Dieppe, while the inner basin was covered with ice several inches thick. It cannot be said that we solved the problem of heating to our satisfaction. There were three coal stoves in the theatre, and these were supplemented by Valor Perfection stoves. To begin with we had the Canadian type of coal stove. These were not satisfactory, as it was impossible to rake them out without filling the theatre with dust. The Canadian type was superseded by the "dumpy" type. These stoves were shaped like two bee skeps fitted together, one inverted and the other not. They were an improvement, but required a lot of attention, and they also could not be raked out while operations were in progress. At the beginning of a list they would be red-hot, and then after an hour they would have spent themselves and the temperature in the theatre would fall from 80° to 50° F. very quickly.

The hospital extending marquee had a double roof and single walls. With single walls the lighting in the theatre was such that certain operations could be performed without artificial illumination. As the weather became colder it became necessary to put on double walls in order to maintain the theatre temperature. This made the theatre so dark that artificial lighting was always required. The lighting was at first by acetylene. We were not very successful with this, mainly owing to flakes of carbon forming on the burners that were inclined to fall down on to the field of operation. I understand that better results were obtained in the last war, and if necessity had compelled us to gain more experience our results might have been better. The electric light was soon in operation. The light over the tables consisted of six 60-watt bulbs arranged round the circumference of a board fifteen inches in diameter. The power was provided by a petrol engine that drove a dynamo. There were no accumulators. This lighting proved very satisfactory.

Operative Arrangements

The theatre was laid out with two operating tables at each end of the tent, and there was room for another in the middle in the event of a severe rush of work. Before operation most patients were transferred to one of two operation wards. These wards had fewer beds and extra nursing staff, and were under the direct charge of the surgeons concerned. This greatly simplified the post-operative care of one's patients,

and was an altogether admirable arrangement. Patients for operation had to be taken to the theatre over sixty yards of rough ground, sometimes while snow or rain was falling, but operations were postponed when the conditions were particularly severe. Operations other than minor ones were also put off on windy days. It was found by exposing agar plates that the number of organisms in the theatre air rose considerably on windy days.

To mitigate the effects of the dust, Lieut.-Colonel Ogier Ward and Lieut.-Colonel Hayes devised a kind of bird-cage made of Cramer wire splinting, which was erected on the instrument table. This was covered with sterile towels and effectively prevented dust from falling on to the instruments. At first that conservative but indispensable body the nursing staff was inclined to scoff at this innovation, but it proved its worth, and at the end of a list an examination of the sterile towel on top showed the dust that would have fallen on to the table. A similar device is used by Mr. Hugh Cairns, and the principle might well prove of value for routine operations even in the most modern theatre.

From the first the commanding officer and the consulting surgeon decided that under the existing conditions we were not justified in operating on knee-joints or in undertaking any major abdominal surgery except in an emergency. The absence of serious post-operative complications undoubtedly justified this policy.

It will be seen that to a great extent we were the victims of circumstance, but in spite of this up to the beginning of May, 1940, over 600 operations were done. After that time casualties began to arrive in steadily increasing numbers, and my records of the last three weeks until the hospital was evacuated on May 20 are not complete. The operations were mainly for hernias, haemorrhoids, ear, nose, and throat conditions, and hallux valgus; cystoscopies were also performed. One brain abscess was successfully drained and a small number of acute abdominal emergencies were undertaken. Until May 1 operations for hernia numbered 95, of which 55 were performed under pentothal and N₂O and O₂, and 40 under spinal anaesthesia.

In December and January we had a certain number of post-operative chest complications. These were all of the same type. The patients ran a temperature of 99° to 100° for three or four days, with cough, some muco-purulent sputum, but no definite physical signs. None of these cases were serious and all cleared up. The incidence in this small series was confined to the operations for hernia, and was slightly greater in the cases operated under spinal analgesia than in those done under pentothal and N₂O and O₂. It is interesting that slight post-operative pulmonary complications were common in many of the hospitals in France during the winter, but later they almost disappeared. It is impossible to assess the causes accurately, as so many factors were improved as time went on.

In general the anaesthetists were responsible for the arrangement of operating lists, for ordering the premedication, and for ensuring that patients were brought to the theatre and taken back to the wards to time. I borrowed an idea from Prof. Macintosh of Oxford: all patients who came to the theatre had a label attached to them on which were written their name, their ward, the nature of the operation, and the method of premedication and the time it was given. Before the patient returned to the ward the anaesthetist wrote on the back of the label the type of anaesthetic that had been given, for the guidance of the sister in charge. This system was a great help in organizing the flow of cases and in seeing that they were returned to the right wards. It was particularly useful when more than one table was in use.

The Anaesthetic Technique

The routine premedication was omnopon 1/3 grain and scopolamine 1/150 grain. This was given one to one and a half hours before operation. At first omnopon was not available and morphine 1/4 grain and atropine 1/150 grain was employed. It was noticeable that the sedation was far more marked when omnopon and scopolamine was used. This was due to the absence of the stimulating effect of atropine, which to some extent nullifies the action of the morphine. When a rapid effect was required the omnopon and scopolamine was given intravenously. This procedure was of great assistance in

emergencies, and it is surprising that it is not more commonly adopted.

In most cases it was found preferable to induce the patient in the theatre, as the passage between the anaesthetic room and the theatre was low and narrow. But for the difficulty of heating, it might have been better for the theatre and anaesthetic room to be in one tent, divided by screens. In most cases induction was effected by 0.5 gramme of pentothal, followed by N_2O and O_2 . For all operations except tonsillectomies this was all that was given. Ether was avoided, not so much because of the open fires, but because it was felt that the good post-operative condition of the patients justified their occasional slightly suboxygenated appearance during the operation. As the time of operation wore on it was striking how much the oxygen percentage could be increased. When convoys of battle casualties began to arrive one observed the truth of Cannon's work in the war of 1914-18. These men had sometimes been forty-eight hours or more coming by ambulance train from the C.C.S. They were very tired as well as suffering from the effects of their injuries, and it was noticeable that a much higher proportion of oxygen, sometimes as high as 30%, was required in anaesthetizing them with nitrous oxide and oxygen.

Some authorities have advocated continuous pentothal as the ideal anaesthetic for the field. From the foregoing it will be seen that I am not prejudiced against intravenous anaesthesia, but I am certain that its widespread use for the shocked, or what Wesley Bourne calls the "handicapped," patient will show an unfavourable mortality rate compared with that following anaesthesia with nitrous oxide or cyclopropane.

The tonsillectomies had the nose and throat cocaineized and a dental prop inserted in the mouth before induction with pentothal. The insertion of a prop was important, as otherwise the patient had to be carried to an unnecessarily deep plane of anaesthesia simply to relax the jaw sufficiently for the insertion of the Boyle-Davis gag. After 0.5 gramme of pentothal 100% N_2O was given, a Magill's tube was passed, and the throat packed off with gauze soaked in olive oil. Anaesthesia was then continued with N_2O and O_2 . In some cases this sufficed, but in most the patient was inclined to gag as the effect of the pentothal wore off. A small quantity of chloroform was added to prevent this.

The drugs available for spinal analgesia were 1 in 1,500 percaine and 5% stovaine. Light percaine was used for the hernias and laparotomies that were performed under spinal analgesia. The Etherington-Wilson technique was usually employed. All the haemorrhoids and some of the cystoscopies were anaesthetized with 5% stovaine. For these operations, what Maxson called the "sitting bull" method was employed. The patient was sat up and 1 c.c.m. of stovaine given, the patient being kept sitting for three minutes. This method is admirably suited to these operations. It was observed that the "Army back" was an easy one on which to perform spinal puncture. The lateral approach was tried, and eventually became the method of choice. This is favoured more in the United States than here. By avoiding the tough intraspinal ligament one is less liable to bend a fine needle, and it eliminates the need for a Sise introducer.

The Trendelenburg operations for varicose veins were all done under local anaesthesia. One brachial plexus block was performed following Patrick's technique, and was quite successful, but the scope for this method seems very limited.

Conclusion

Only a few days before the hospital was evacuated we moved into the new hutted theatre. This was not finished, but we were compelled to take this step owing to the difficulty of "blacking out" a tented theatre while working at night with adequate lighting. Even in its unfinished state this theatre was a great improvement on the tent, and served to throw into relief the disabilities under which we had worked for the previous six months. However, I hope I have shown that what one might call medium surgery is possible in a tented theatre without any sacrifice of professional standards. Unfortunately we were only to enjoy the new theatre for a few days before evacuation was ordered. It was most depressing to leave the hospital which one had watched grow from

the time when there was nothing but a bare and exposed field and in which one had worked through a long and severe winter; but we left much richer in experience than when we arrived in the middle of September, 1939.

I must thank my commanding officer, Colonel A. L. Foster, for reading the proofs and for his permission to publish this paper.

ECONOMY IN THE USE OF DRUGS FOR SKIN DISEASES

The Therapeutic Requirements Committee of the Medical Research Council has carried a step further its examination of the economies that can be made at the present time in the use of drugs, and has classified those employed in dermatological practice. The classification is identical with that of the previous memorandum, which was discussed in these columns on October 12 (p. 499), namely:

A. Drugs which are either readily available at present or regarded as essential.

B. Drugs which are essential for certain purposes but the use of which should be restricted.

C. Drugs which are not essential and do not justify importation or manufacture in wartime.

The following are the drugs included in categories B and C, together with the committee's notes:

Drug	Category	Remarks
Acid boric	B	Saline compresses may be used instead of boric fomentations, and for dusting powders it may be replaced by talc, zinc oxide, magnesium trisilicate, or kaolin
Adeps benz. ..	B	Under Government control. See Note 1 below
Alumin. acetat. ..	B	Lead acetate is often interchangeable
Amylum	B	Under Government control. Substitute saline compresses for starch poultices, and for powders see remarks to boric acid
Borax	B	Reserve for ung. aquos. The glycerin and the honey of borax may be replaced by watery solutions of aniline dyes in the treatment of thrush
Chrysarobin ..	B	Substitute dioxyanthranol
Glycerin	B	Substitutes are under investigation
Hydrarg. ammon. ..	B	See Notes 2 and 3 below
Hydrarg. perchlor. ..	B	Substitute an antiseptic of the chlorinated phenol type
Iodum	B	See Notes 2 and 3 below. Substitute proflavin, acriflavin, trinitrophenol, crystal violet, brilliant green
Magnes. sulph. ..	B	Substitute sodium sulphate
Ol. amygdalae ..	C	All vegetable oils and fats are under Government control. Arachis and other vegetable oils may be used if available. See Note 1 below
Ol. olivae	B	
Ol. sesame	B	
Paraffin liq. ..	B	Under Government control
Paraffin. molle ..	B	See Note 1 below
Potass. sulphurata ..	C	Substitute sulphur ointment or liq. cal'is sulphurata
Zinci aleostearas ..	B	

The following are the notes referred to in the table which were attached to the memorandum:

1. *Ointments*.—For many of the purposes for which ointments are often prescribed pastes and creams are more satisfactory and require only about half the amount of fatty basis. In certain circumstances fatty vehicles can be replaced by wet dressings, either with or without mucilage to increase the viscosity, antiseptic paints and varnishes, or powders.

2. *Antiseptics*.—Boric acid and iodine need not be used in dermatology. The amount of mercury used could be greatly reduced, and it need only be available for trial in cases in which alternative antiseptics have not proved satisfactory. If the antiseptics for local application to the skin were limited to aniline dyes, coal-tar derivatives, salicylic acid, sulphur, ichthammol, resorcin, dioxyanthranol, silver nitrate, and tar, the treatment of few skin diseases would suffer greatly as a result. Tar in the form of crude gasworks tar is an efficient and cheap preparation.

3. *Ringworm*.—Mercurials and iodine are rarely required for the treatment of ringworm, whereas a paint containing fuchsin and Whitfield's ointment of benzoic and salicylic acid are effective remedies which are freely available.

4. *Scabies*.—Should epidemics of scabies occur, treatment will be most economically carried out if put under the control