Middle Articles

OUTSIDE EUROPE

Ibo Civilian Casualties in the Nigerian Civil War

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"Ex Africa semper aliquid novi..." Pliny

Throughout history there have been many small local wars, often involving wholesale starvation and occasionally the elimination of whole populations or tribes. The Nigerian Civil War is the most recent of these wars, but it is well known to people in Europe and America because of the widespread Press coverage, a phenomenon unknown regarding other wars of this kind, with the possible exception of Vietnam.

This article describes the conditions under which the war was fought, the kind of casualties that occurred among the Ibo civilians, the methods of treating them, and the sort of organization that was evolved to deal with civilian casualties. I am well aware that the surgery of warfare has been adequately described by the great masters of surgery (Gordon Taylor, 1953; Ogilvie, 1944a, 1944b; Beebe and De Bakey, 1952), but surgery has changed vastly since those days, and this war has some special lessons to teach, since it was fought over some of the most difficult country in the world. The starvation and the relief operation have been adequately described (Hughes, 1969), and yet this malnutrition and subnutrition has enormous relevance to the surgical problems of the civilian casualties, especially the children, who make up an important part of the total.

For the younger surgeon war surgery is something of which he has no experience, nor, while the United Kingdom remains at peace, is he likely to get any, unless he serves for a time in one of the local theatres of war. Those who learned their war surgery in the second world war have now attained a seniority which justly relieves them of involvement, and the nature of the conflict has changed. The time is therefore opportune to review and record experience recently gained, for the assistance of other, younger, men who may be involved, and also to record a small part of the medical history of the Nigerian Civil War.

Organization for Civilian Casualties

Enugu was successively capital of the Eastern Region of Nigeria, of the East Central State of Nigeria after the Eastern Region had been split up into three states, and of Biafra after secession was declared in May 1967 until it fell to the Federal Army in October 1967. In May 1968 the Federal Ministry of Health agreed to the suggestion by the British Government that a British medical team should be sent out to open the Enugu General Hospital (formerly the University of Biafra Teaching Hospital). It was stipulated that the team should have a paediatric basis so that when the war was over, and Ibo doctors had returned, the team could retire to a paediatric unit within the hospital they had set up. Our first job was therefore to reopen the Enugu General Hospital, and to set up a "base" hospital there for the Red Cross doctors who were ministering to four million Ibo civilians who found themselves on the Federal side.

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The advance party arrived in December 1968, and by the middle of January 1969 the unit was fully operational. We found the hospital buildings intact (Fig. 1), but they had been unused for one year. There was no water supply, and the town electricity supply was very erratic, always being off from 23.00 to 06.00 hours. In March and April there was no electricity at all. The hospital had been designed to run on electricity, and without a supply the position was parlous. We managed to get hold of an ancient generator from Ojukwu's country house to run essential services and light the theatre when necessary, and this was later replaced by a more modern Italian one, which served us well. Generators, however, need diesel to run on, and this commodity was wanted by the Army to conduct the war, so great care had to be taken of

FIG. 1.—Enugu General Hospital 1969.

that which was obtained. Water presented an even greater problem. Initially, the hospital was supplied by a Land-Rover with three 50-gallon (227-litre) drums on its trailer, but it was obvious that this would soon be inadequate, and the British Government quickly sent a 600-gallon (2,727-litre) water carrier.

It is not easy to run an operating-theatre with a short supply of water. All water for scrubbing had to be boiled, cooled, and then poured by an orderly on to the surgeon's hands—not a very efficient method. The theatre was cleaned and painted to make it serviceable, and we found operation tables, theatre lights, diathermy and suction machines, and autoclaves in good condition. Most of the general surgical instruments had been stolen, but the thoracic, neurosurgical, and orthopaedic instruments were nearly all intact. Her Majesty's Government supplied the missing instruments and the expendable equipment, as well as all the drugs. The maximum use was made of disposable and paper equipment, because the shortage of water and electricity made a lot of autoclaving a problem, and this policy paid dividends in saving time, cutting down infection, and making it safer and easier for untrained staff to do dressings. Two wards were cleaned, painted and prepared, one for adults and one for children, each staffed by a British nursing sister, who was assisted by a number of

untrained local girls who spoke English and could act as interpreters. A children's clinic and a casualty reception area were opened, and the latter was divided into a resuscitation area and a dressing-station.

The War

The East Central State of Nigeria (ex Biafra) is on the northern border of the tropical rain forest, and so there is a mixture of dense forests and more open savanna type of country (Fig. 2). As a result the war was fought mainly along the roads. The population in this part of West Africa is particularly dense, and the civilian population was swollen by

FIG. 2.—Typical view in environs of Enugu.

FIG. 3.—Patient arriving on a stretcher of board and palm mats, with most of his village.

refugees, who had responded to Ojukwu's call in October 1966 to all Ibos to return to their homeland. They showed little understanding of what was happening—indeed military personnel often seemed to find it difficult to comprehend—and many civilians found themselves in the line of fire. Very often moving objects were shot at indiscriminately, and only later were discovered to be women and children. The opposing armies had a variety of camp followers with them at the front line, and these, having no instructions in elementary precautions of cover and camouflage, were very often shot.

The fighting was going on 30 miles (48 km.) from Enugu, to the south, when the unit arrived, and moved further south when Umuahia fell in May 1969. Though 30 miles does not seem a long way, evacuation was difficult, and every casualty had to be brought by the Federal Army at the expense of one of its own casualties, or by the Red Cross, as there was no local transport whatsoever (Fig. 3). As a consequence, some of the wounds were two to three days old when they reached the hospital, presenting grave problems of infection and management. The Nigerian Army went to great pains to bring to the unit any civilian who asked them for help, and many of our "freshest" casualties fell into this category. Another potent problem was the fine careless rapture with which some

Africans handle firearms, for many civilians were wounded in "accidents."

The fighting was sporadic, but an increase brought a rise in the civilian casualty rate. Even during lulls in the fighting we were kept busy by bombing of civilian markets by the Biafrans, unexplained explosions of ammunition, and a small but continuous guerilla activity.

Types of Casualty

The number of persons treated and the site of their injuries are shown in Table I. Injuries were classified according to the major injury, but there were few who did not have some trauma to another part of the body. This secondary injury is not recorded in Table I so the figures relate only to the actual number of patients treated. The distribution of deaths and the site of major injury that each patient who died sustained are shown in Table II. Abdominal wounds were the most lethal injuries, and this is in keeping with experience in other wars (Wallace, 1918; Ogilvie, 1944a, 1944b; Lowden, 1944; Sako *et al.*, 1955; Dudley *et al.*, 1968). Our overall mortality was

TABLE I.—Types of Casualties from War Wounds Seen During January to December 1969

	Head and Neck	Arm	Hand	Chest	Abdominal and Abdomino-Thoracic	Leg	Total
Adults	32	40	20	40	64	88	284
Children	8	12	6	4	8	16	54
Total	40	52	26	44	72	104	338

TABLE II.—Mortality from War Casualties. January to December 1969

	Head and Neck	Arm	Hand	Chest	Abdominal and Abdomino-Thoracic	Leg	Total
Adults	2	0	0	1	13	2	18
Children	1	0	0	0	2	1	4
Total	3	0	0	1	15	3	22

6.3%, and this compares favourably with other recorded series. Factors other than those seen in healthy soldiers obviously made recovery difficult and helped to produce fatal results.

Only one patient with kwashiorkor was seen who had sustained a wound, a bullet fracturing the femur, and her kwashiorkor improved considerably in the first week on a hospital diet. But experience leads to the belief that a large number of the population suffered from subnutrition, which prevented them from responding to massive trauma as quickly as the healthy well-nourished man. Malaria and sickle-cell anaemia cause the wounded to start off at a disadvantage, with a lower number of red cells. But our mortality figures compare well with those obtained in Vietnam among civilians (Brass, 1967), and show a spectacular improvement on those for the second world war. (Cope, 1953). The latter improvement is due to the availability of a whole range of potent antibiotics and modern anaesthetic techniques we were fortunate enough to have, and in no way due to any advance in surgical methods of treatment. Assistance and comfort were obtained from reading the way that Aird (1944), Ogilvie (1944a, 1944b), and Lowden (1944) tackled similar problems in the second world war.

Resuscitation

Blood was in short supply, as it all had to be collected by the unit's own laboratory staff, who had to persuade potential

donors to give. A very small quantity was obtained from the Nigerian Army, but when the fighting was at its height their need for blood was greater than their supply. It was at times like this that we had our greatest need for blood too. Routinely, saline infusions were given in order to raise the blood volume quickly and to obtain time to find and cross-match a donor. Blood was then given if necessary, and was usually supplemented by dextran of high molecular weight (Macrodex). Infusion was established by means of a percutaneous intravenous canula (Plectrocan), and if this was at all difficult resort to a cut-down was readily made. Blood was usually fresh, and rarely more than 48 hours old, and this factor, combined with the hot climate, made warming coils unnecessary. The monitoring of these transfusions was difficult, as it was found that untrained staff could not use the C.V.P. manometers easily, and trained staff could not be spared to look after them.

A careful chart of urinary output with a catheter in the bladder was always kept, and this served as an adequate check on the patient's course, together with the pulse rate and the systolic pressure, all recorded on the same chart. Re-establishment of a good peripheral circulation was done in the casualty department before the patient was transferred to theatre or ward, unless operation was necessary for the arrest of haemorrhage. In retrospect, it was possible to get away with using much less blood than usual in similar circumstances in the United Kingdom or Vietnam. The most that was ever given to a single patient was five units (5×500 ml.). Under these conditions this sparing use of blood was dictated by circumstance, but no patient died because of lack of blood. This may be either because the use of a large volume of dextran and crystalline fluids combined with a small volume of blood is sufficient for a patient who has been habituated to a low haemoglobin or because those patients who had a very large haemorrhage or who needed large quantities of blood died before they could be brought to hospital. Both possibilities were peculiar to the conditions in which we worked, but it does suggest that in a population where evacuation is difficult, and where haemoglobin is chronically low, the need for blood is not quite so urgent as it is in a situation such as the U.S. Army finds itself in in Vietnam. The fact still remains, however, that if blood is available it is the ideal fluid to give.

Methods of Treatment

Limb Wounds

As this hospital acted as a forward surgical unit, a casualty clearing station, and a base hospital, the complete treatment of patients had to be carried out there. This paper is concerned with the immediate treatment of casualties; therefore any treatment after the first week is not discussed. The policy that all wounds would be dirty and must therefore not be sutured was adopted, and the correctness of this attitude was amply demonstrated by the catastrophes that occurred when wounds were sutured by keen young relief team doctors. We also adopted the "wound trimming" technique described by Ogilvie (1944a, 1944b) which consists of the removal of foreign matter and grossly lacerated tissues and the relief of tension throughout the wound, so that any accumulation in its deeper parts should more readily escape to the surface than along muscular planes. This procedure saved a great deal of time, and brought a result comparable with the classical debridement, where careful excision is required. A stream of antiseptic from an overhead container—that is, bladder wash-out apparatus—was found to be an invaluable method of cleaning the wound. Only obviously dead muscle was excised, and this was estimated from its tendency to bleed when cut. Gas-gangrene was seen on only two occasions, both where the main supply artery to the limb had been severed more than 24 hours before the patient was seen. Gas-gangrene was not seen in

wounds treated in the hospital, and anti-gas-gangrene serum was never used prophylactically.

After trimming, wounds were packed with bismuth and iodoform paste (bipp) or acriflavine and left to granulate, either for secondary suture on the seventh to tenth day or for a plastic procedure at three weeks. Only in hand injuries were grafts applied or flaps swung at an early date. Many of these hand injuries were so dirty that they had to be treated for some days before they became clean. Tetanus prophylaxis always provokes argument among physicians, and this unit was no exception. Eventually a policy of passive immunization of all wounds was adopted, assuming all patients to be non-immune. The basis of the scheme adopted was that used by the British Army (War Office, 1950). Fractures combined with soft-tissue injuries were treated with immediate internal fixation where this was practicable, for as Dudley *et al.* (1968) point out, implanted metal does not of itself cause infection, and if all dead tissue, including bone, is excised, rigid internal fixation provides better circumstances for healing.

Abdominal and Abdomino-Thoracic Injuries

The largest number of deaths were caused by this type of wound, and this is in keeping with other reported series (Aird, 1944; Lowden, 1944; Blackburn and Rob, 1945; Beebe and De Bakey, 1952; Gordon Taylor, 1953; Dudley *et al.*, 1968). Energetic resuscitation, the availability of blood, modern anaesthesia, and the free use of antibiotics were the main causes contributory to the relatively high rate of recovery. All cases were operated on within six hours of admission, with the exception of four cases which were postponed so that the surgical team could get some sleep, after a Biafran air raid on a village market had brought 71 casualties (Fig. 4). Some

FIG. 4.—Adult ward after admission of 71 casualties.

missiles created gross internal damage from a small puncture wound, probably because of the type of exploding bullet used; and spent bullets tended to produce very bizarre injuries. The following two case histories are illustrative.

Case 47.—A 40-year-old man was admitted at 23.00 hours with a history of having been shot from the front by Biafran irregulars six hours previously. He had a small wound 1 cm. long in the right hypochondrium and paralysis of both legs. His bladder was distended. The abdomen was also slightly distended and was diffusely tender, with rebound tenderness. There were no bowel sounds. Haemoglobin was 12.8g./100 ml. Electrolytes were Na 141 mEq/l., K 4.6 mEq/l., Cl 91 mEq/l., HCO_3 19.4 mEq/l., Urea

was 24 mg./100 ml. Blood pressure was 90/40 mm./Hg. X-ray examination revealed a shattered second lumbar vertebra, fluid levels in distended bowel, and small pieces of metal scattered around the abdomen. He was resuscitated with 1 litre of Macrodex, 1 litre of normal saline, and 1 litre of blood, and was taken to the theatre within one hour of admission. Abdominal exploration showed that the bullet had entered and traversed the ascending colon and then struck the second lumbar vertebra, where it must have ricocheted forwards, upwards, and laterally, perforating the stomach with one fragment, the first part of the duodenum with a second, and the common bile duct with a third. The peritoneal cavity was filled with about 500 ml. of foul-smelling fluid. The holes in the viscera were closed and oversewn, and the common bile duct was divided at the point of injury, the ends cut flush, mobilized and repaired over a T-tube. Postoperatively he was treated with 4.3% dextrose in 0.18% normal saline intravenously, an indwelling nasogastric tube, and colomycin, ampicillin, and erythromycin. Despite a rather prolonged ileus, his recovery was good, but he developed a faecal fistula from the ascending colon on the fifth day, as the ileus was recovering. Bronchopneumonia developed, and despite tracheostomy, etc., he died on the 10th day.

Case 122.—A man aged about 24 years was brought from the Convent Hospital 50 miles (80 km.) away with a history of having been shot in the chest about 15 hours previously. Resuscitation had begun at the Convent Hospital, and he was in quite good condition, with a blood pressure of 120/60 mm. Hg. Haemoglobin was 9.8 g/100 ml. and serum electrolytes were normal. He had a small wound over his precordium and a distended abdomen. Bowel sounds were absent. He had no air entry over the whole of the left lung, the heart was moved to the left, and the left side of the chest was hyperresonant. X-ray examination confirmed the presence of a pneumothorax on the left, and showed a bullet, obviously spent, lying in the peritoneal cavity. The abdomen was explored through a right Kocher's incision, so that the left chest could be opened by continuing the incision, if necessary. It was found that the bullet was not in the peritoneal cavity, but inside the jejunum. There was a small hole high up on the lesser curvature of the stomach where it had entered the gastrointestinal tract, and a ragged hole in the diaphragm in the central tendon where it had entered the abdomen. The incision was extended to open the left side of the chest, and it was seen that the bullet had entered the pericardium and scored the myocardium of the left ventricle before passing through the diaphragm and entering the stomach. All the structures were repaired, and with an underwater seal drain the lung rapidly expanded. No attempt was made to remove the bullet which was passed per rectum some days later. The patient made an uneventful recovery, and went to work as a ward orderly in the Convent Hospital.

When the first emergencies presented in January 1969 the unit had not obtained any supplies of catgut, and therefore non-absorbable suture had to be used for all surgery for a few weeks. It was noticed that the wound infection rate was lower than that which would be expected. When the catgut arrived it was observed that the wound infection rate rose slightly. Though there are no figures and no objective judgement to support it, I formed the clear impression that non-absorbable suture material, especially a sealed mixture of polyester and linen (Ethicot), by being less reactive, causes fewer wounds to become infected.

Wounds of the colon included in the total number of abdominal wounds amount to about 25% (17 cases). In the first six of these the colon was exteriorized or a colostomy performed. This caused a great deal of mess in unsophisticated patients, who were unable to tolerate ileostomy bags and this sort of appliance, and a lot of tension in our untrained girls, who were unwilling to clear it up. I decided, therefore, to try to close the colonic wounds as a one-stage procedure. I was fully aware of the dire dangers that are said to follow this approach (Rains and Capper, 1965), but it seemed the only way out of a difficult situation, and would have the advantage of allowing the time spent on a second operation to be given to some other patient.

The edges of any hole or tear in the colon were always carefully excised, and they were then closed with 2/0 Ethicot, in one layer, with no tension. The abdomen was then washed out with a litre of 20% mercuric chloride, and dried out with mops. Polybactrin (polymyxin, neomycin, bacitracin) was then sprayed into the cavity, and the abdomen closed with drainage, more Polybactrin being sprayed in as each layer was closed. The patients were treated postoperatively with a five-day course of colomycin, ampicillin, and erythromycin. The results of this procedure were encouraging. There were three deaths, but two of these patients had had their injuries for 31 and 39 hours respectively before admission (Table III, Cases 5 and 9). The third (Case 47) had a paraplegia and died of bronchopneumonia. There was one death in those six patients treated by colostomy or exteriorization. In the patients treated with primary closure of the colonic wound there was no wound dehiscence (all abdomens were closed with non-absorbable suture to the muscular layers and the skin), and two cases of faecal fistula, through the drainage track. One of

TABLE III.—*Abdominal Injuries More than 24 Hours Old*

Case No.	Age and Sex	Hours before Admission	Injury	Operation	Complications	Result
1	40 M	26	Perforation of sigmoid colon. Fractured femur	Colostomy. Thomas splint applied	Acute renal failure	Died
2	25 F	29	Ruptured liver and perforated 3rd part of duodenum	Liver packed with Gelfoam and perforation oversewn		Recovered
3	22 M	29	Multiple perforations of ileum and perforation of caecum. Fractured humerus and scapula	Section of ileum resected, perforations in caecum closed. Humerus plated	Wound infection	Recovered
4	32 M	30	Ruptured liver and torn gall bladder	Liver packed with Gelfoam. Cholecystectomy	Small bile leak which closed spontaneously	Recovered
5	6 M	31	Perforations of transverse colon and torn duodenum	Section of colon resected and duodenum repaired	Post-operative acute pancreatitis	Died
6	18 F	33	Ruptured spleen and open pneumothorax. Hand injury	Splenectomy and closure of pneumothorax with underwater seal drain. Wound-trimming		Recovered
7	39 M	35	Multiple perforations of ileum. Fractured femur	Perforations oversewn. K. Nail to femur	Broncho pneumonia	Died
8	15 F	36	Torn mesentery. Fractured pelvis	Mesentery repaired	Secondary haemorrhage	Died
9	26 F	39	Torn ascending colon. Very ragged colonic wall. Peritonitis. Pott's fracture L. ankle	Right hemicolectomy	Gram-negative shock	Died
10	260 F	41	Ruptured L. Kidney	Nephrectomy		Recovered
11	18 M	42	Spent bullet had gone up patient's anus, perforating anterior wall of rectum, bladder, and out into peritoneum	Holes in bladder repaired. Hole in rectum only drained		Recovered
12	22 F	42	Multiple perforations of jejunum and ileum. Head injury—subdural haemorrhage	Perforations repaired. Burr holes		Died

these was in Case 47 as described, and the other closed spontaneously after 10 days.

As stated previously one of the most difficult problems was the transport of patients to hospital. The success of the procedure varied with the time taken to arrive, and Table III shows the results of 12 patients who arrived more than 24 hours after injury. As expected a 50% mortality rate is higher than that in the whole series of abdominal injuries and is not much of an improvement on the days before antibiotics (Aird, 1944). This shows how important speedy evacuation is with this kind of injury, and where evacuation is good, as in Vietnam, the mortality is lower (Dudley *et al.*, 1968). In this series abdomino-thoracic wounds did not appear to have a worse prognosis than abdominal wounds.

Chest Wounds

Though these 44 wounds were mainly minor, in the major ones great success was obtained with conservative treatment and by making free use of tracheostomy. On only two occasions had thoracotomy to be performed, and a third was about to be attempted when the patient died. This was the only death from a chest injury and is described below.

Case 298.—A young Ibo woman had been shot at point blank range in the right side of her chest by her "husband," a Hausa soldier, in the course of a romantic tiff. The weapon that had been used was an automatic rifle of Russian manufacture, and several bullets must have penetrated her chest. On examination she was severely shocked, with an unrecordable blood pressure, and a large hole in her right apex which was no longer bleeding. The brachial plexus, the subclavian artery and vein, and the whole apex of the lung had been destroyed. After resuscitation with blood it was found that she had no radial pulse, but the hand was warm and the finger-nails were pink. She was taken to the theatre and an attempt made to close the gap by using flaps of skin from the neck and breast. This was initially successful, and she returned to the ward with an intercostal underwater seal drain. Postoperative x-ray examination showed no expansion of the lung, and it became clear that a lobectomy would have to be performed to close the broncho-pleural fistula. While preparations for this were being made she had a cardiac arrest from which she did not recover. Permission for necropsy was refused.

Conclusions

A general picture is presented of the background against which 338 Ibo civilian casualties were treated at Enugu General Hospital by members of the Child Medical Care Unit,

sent out by the British Ministry of Overseas Development, during 1969, the final year of the Nigerian Civil War. The overall mortality rate was 6.3%. Much has been written about the American military experience in Vietnam (Schmitt *et al.*, 1967), but little about the treatment of civilians (Brass, 1967; Dudley *et al.*, 1968) in these conditions. These people, often innocent bystanders unaware of the purposes of war, always have an understaffed and underfinanced medical organization, if it exists at all. The lack of medical and surgical personnel was our outstanding problem in Enugu. No single surgeon can hope to have such a wide experience as was relatively common in the second world war, and so every little episode should be recorded to form a common pool. I have been greatly helped and encouraged by those who have written about their experiences in the second world war (Aird, 1944; Lowden, 1944; Ogilvie, 1944a, 1944b), in Korea (Sako *et al.*, 1955), and in Vietnam (Schmitt *et al.*), and I hope that my little contribution may be added to these others.

My grateful thanks go to the Child Medical Care Unit, whose skill in the wards, in the laboratory, and in the x-ray department, and devotion to their patients, contributed so much to the survival of those in their charge. I would specially single out my medical colleagues, Dr. Michael Haggie, the unit's leader, Dr. Paul Buchanan, and Dr. Chris Hutter, our anaesthetist, and Miss B. J. Farley, who organized and trained an excellent theatre team from a group of people, all except one of whom had never before been inside an operating-theatre. I also wish to thank Newcastle Regional Hospital Board, who gave me a year's leave to join this unit, and Mr. A. H. Petty and Professor I. D. A. Johnston, who encouraged and helped me with the writing of this paper.

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