ORTHOPAEDICS IN NORTHERN NIGERIA

BY

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In December, 1958, the Royal National Orthopaedic Hospital started a scheme whereby two nursing sisters and one registrar were seconded to the orthopaedic unit in Kano, Northern Nigeria. I was fortunate in being the first registrar chosen for the secondment, and this article is a record of my experience during 18 months' service in Northern Nigeria.

Historical Background

Until the present century the region north of the Niger-Benue confluence was made up of Hausa states, each ruled by an emir. Lord Lugard united these emirates under the British flag and became the first Governor of the Northern Nigerian Protectorate. The native laws and customs were respected under Lugard's system of indirect rule, and local government remained in the hands of the emirs and their native authorities.

Although an era of peace followed, the region remained relatively undeveloped. The only education was in the Mohammedan religious schools, where boys were taught the Koran but little else. The Christian Missions with their dissemination of knowledge of the outside world had very little influence in this Moslem community.

A medical service was set up, staffed by medical and nursing officers of the Colonial Service, and hospitals, dispensaries, and nurses' training schools were opened. Mobile teams, trained to deal with such problems as leprosy and sleeping sickness, were also introduced.

In 1952, after a visit by Mr. H. J. Seddon, the adviser in orthopaedics to the Colonial Office, it was decided to form a regional orthopaedic unit with its own hospital in Kano. Mr. A. F. Bryson was appointed as senior specialist in orthopaedics, and he was given the use of some beds in the Kano City Hospital. This hospital has 400 beds and is administered by the Kano Native Authority. Plans for a 150-bed orthopaedic hospital to be built in Kano City were approved by the Government. The construction was seriously delayed by financial and other difficulties, and when Mr. P. H. Newman visited Kano on his advisory tour of British West Africa in 1957 the building was not yet finished. However, plans were made for the adoption of the hospital by the Royal National Orthopaedic Hospital, which undertook to help to staff the Kano unit with seconded personnel.

Topographical Features

Northern Nigeria has an area of 280,000 square miles (725,200 sq. km.), or about five times the area of England and Wales. The population of 19 millions makes it one of the most densely populated parts of Africa. Kano, with about 150,000 inhabitants, is the largest town (Fig. 1). Most of the region consists of

savannah country, great flat grasslands dotted with trees, and with numerous small villages and patches of cultivation. The people are mainly peasant farmers, growing corn, ground-nuts, and root crops, and raising cattle. All the main towns are connected by roads and some by rail also, but many villages can be reached only by foot or on horseback. Kano has an important international airport.

The city of Kano has been a centre of commerce for a thousand years. Camel caravans crossing the Sahara have always used it for a base and still do so. A mud wall 11 miles (17.7 km.) in circumference surrounds the city. The houses are of mud, densely packed together in compounds with narrow winding streets between them. Men swathed in robes and turbans ride on horses or donkeys. Women with large earthenware pots on their heads collect water for their households. Palm trees hang their fronds limply in the still air and the sun glares remorselessly from the zenith of a cloudless sky.

Climate and People

Kano is 12 degrees north of the equator. For seven months of the year no rain falls, and by April the

Fig. 1.—Kano City. Crowds approaching the Mosque.

ground is parched. Trees and shrubs give a little green contrast to an otherwise monotonous landscape. The midday temperature rises above 100° F. (37.8° C.), but the humidity is low and the heat is bearable, although it slows the tempo of work.

During April and May the humidity rises and the rainy season starts with a series of violent thunderstorms and torrential downpours. Drains are flooded and the city streets turned into rivers. Some of the mud houses collapse. All the farming people are busy sowing their crops. Nobody has time to be ill or to attend hospital. The countryside soon becomes green and luscious. Guinea-corn grows to a height of 12 feet (3.6 metres) in three months. Between rainstorms the sun shines and the air is cool and pleasant.

In September the rain stops and soon the country is dry and dusty again and the crops are harvested. A dry, cool northern wind, the Harmattan, starts blowing at about Christmas-time, bringing a fine dust from the desert which settles everywhere and even obscures the sun at times. This Harmattan continues, off and on, for about three months, when the temperature and humidity start to build up for the next rainy season.

The majority of Northern Nigerians are Hausas. They are mostly tall and thin and fine-featured. They are proud, cheerful, and uncomplaining, and they make excellent patients. Their temperament is influenced by the Moslem faith. Sickness, deformity, and death are according to the will of Allah and are accepted without alarm. The crippled and deformed are not shunned by the people and they make a good living as beggars. The Moslems are devout, and the sight of the vast crowds of worshippers before the mosque every Friday is most impressive.

The emirs are great feudal lords and they have considerable powers. They preserve local traditions and colour, and travel with large retinues of richly dressed and uniformed horsemen, councillors, attendants, spear-men, and the like.

There are also people from numerous other tribes in Northern Nigeria. Hausa and English are the main languages.

The Orthopaedic Unit

When I arrived in December, 1958, the orthopaedic hospital was not yet opened. Mr. Bryson was running the traumatic and orthopaedic unit in the city hospital single-handed. He was in charge of 140 beds in seven wards, which were dismal, overcrowded, and inadequately staffed. All the routine ward work was done between 7 a.m. and 2 p.m. For the remaining 17 hours the patients were often in the care of untrained and illiterate nursing orderlies.

An operating-theatre with air-conditioning was used exclusively by the orthopaedic unit. It was run by two very capable Nigerian male charge nurses. These men had worked with Mr. Bryson since the unit was started and had attended a course of training at Oswestry and Birmingham. They had learned to perform amputations, skin-grafting, and minor operations most skilfully and were also excellent plaster technicians.

The hospital had pathological and radiological departments and a blood bank. This latter was run by the anaesthetist, who could devote only one day a week to giving anaesthetics in the orthopaedic theatre. Most of the anaesthetics were given by Nigerian nurses, who were most efficient both with rag and bottle and with thiopentone.

A European nursing sister was attached to the unit to supervise the ward nurses and to allocate stores. There were also in the unit a physiotherapist and a limb-fitter.

The orthopaedic out-patient department was the veranda outside the office. A continuous trickle of patients would arrive throughout the day and sit patiently on the bench or on the ground awaiting their turn. They would be seen between operations or whenever an opportunity occurred. Patients requiring urgent admission were seen by the general-duty medical officer and referred immediately to the orthopaedic department if indicated.

Officially the working day ended at 2 p.m., but often our work continued into the afternoon, and the theatre staff and anaesthetic nurse were on call at all times for emergencies. Either the surgeon or the sister would do a full ward round in the evening. There was plenty of work and little time for elaborate case notes or detailed examinations and investigations.

This orthopaedic unit, the only one in Northern Nigeria, would have been swamped but for certain

factors: (a) Distances and poor communications made it difficult for patients to be sent from far afield. Medical officers in outlying hospitals were encouraged to treat open fractures rather than send them to Kano, where the patients would arrive two or three days later in very poor condition and with grossly infected wounds. (b) Few roads, little traffic, and almost no heavy industry combined to keep the accident rate down. However, the number of "mammy wagons" on the roads is increasing, and these are responsible for many serious accidents. They travel very fast, are crammed with people, and when they overturn up to 40 may be injured.

The temperament of the people also keeps the hospital attendance within bounds. They are stoical and accept sickness uncomplainingly. The countryfolk understand little about modern medicine and are often unwilling to travel long distances to hospitals where they know nobody.

Clinical Material

In spite of the reluctance of the Northern Nigerian to go to hospital, the traumatic and orthopaedic problems seen in Kano are numerous and varied. The following section describes some of the conditions treated and the impressions gained during my 18 months' tour.

Injuries

About one-third of the unit beds are occupied by traumatic cases, mostly from lorry accidents, and many patients with hand injuries and upper-limb fractures are dealt with as out-patients. Cases of femoral fracture, often bilateral, occupy many beds. They are treated routinely with the Thomas splint and fixed skin traction, and the results are excellent. Even the fracture of the upper third of the femoral shaft, with awkward flexion and abduction of the proximal fragment, can usually be controlled by passing the uppermost flannel sling in front of the thigh. Delayed union and non-union are exceptional. Fractures of the femoral neck are rarely seen.

Tibial fractures are very common and are often open and very dirty on admission. There seems to be less tendency to non-union than in Europeans, and these fractures may unite even under large granulating wounds. However, bone grafts (sliding or Phemister type) and, rarely, cross-leg flaps are sometimes required.

Meniscus injuries are rare in Africans, and I saw only two. Intervertebral disk injuries are also very uncommon.

Fractures of the pelvis, involving the ischial and pubic rami or the wing of the ilium, are commonly sustained when a lorry overturns. There is no difficulty in mobilizing these patients. They soon find that they are able to walk, and they then refuse to believe that they have broken a bone. Likewise, stable crush fractures of vertebral bodies are made light of by these stoical patients. Fractures of the spine with paraplegia treated at the City Hospital in my time did badly. The staff was inadequate in number and experience to give the necessary nursing treatment.

One interesting and not uncommon condition is an unreduced dislocation of the elbow two or three weeks old. Open reduction is necessary, and there is such extensive fibrosis and contracture of the soft tissues round the joint that it is impossible to reduce the dislocation without first denuding the lower end of the

humerus of all its attachments. On the other hand, dislocation of the jaw of up to three weeks' duration can be reduced by manipulation under anaesthesia.

A tragic and all-too-frequent complication of simple forearm fractures in children is gangrene of the hand, due to pressure from wooden splints applied by unqualified practitioners. These patients would be brought to hospital, often after walking for several days from isolated villages. The hand and forearm would be completely gangrenous and often infected by gas-forming organisms. Even patients with frank gas-gangrene and gross toxæmia nearly all recover quickly after amputation and the administration of anti-gas-gangrene serum and penicillin.

Deformities from malunited fractures seem to be surprisingly uncommon in a land where many injured people never see a doctor.

Tropical Ulcer

This is one of the most important and distressing surgical problems in Northern Nigeria. Dispensaries are blocked by queues of sufferers with huge stinking ulcers attending for dressings. The lesion, situated usually on the leg, follows infection of a minor cut or abrasion and gradually spreads. The aetiology is still not fully understood. The ulcer may come to involve the whole circumference of the limb, causing gross fibrosis and contracture of underlying muscles and tendons and sometimes periostitis. The persistent purulent discharge seriously saps the health of the patient, so that it is common for his haemoglobin level to be around 30% when he presents himself for treatment. Finally, an epithelioma of low malignancy is almost invariable in any ulcer of more than ten years' standing. The inguinal glands may be involved, and if not excised in time they also fungate. Scarring from ulcers may give rise to bizarre deformities of the legs (Figs. 2 and 3).

FIG. 2

FIG. 3

FIG. 2.—Gross genu recurvatum caused by scarring in front of the knee. FIG. 3.—Popliteal webbing secondary to a chronic ulcer

Mr. Bryson adopted a simple standard routine for the hundreds of these patients who required attention. Under a tourniquet the ulcer is curetted and its edges are excised. The resultant defect is packed with penicillin and sulphonamide powder and bound with a firm dressing. It is then left for a week, by which time there is usually a fairly clean granulating area. This is dressed daily with eusol for a few days until it is ready for Thiersch grafting. In favourable circumstances the patient is out of hospital with a well-healed leg in three to four weeks. Exposed bone or tendon naturally delays the repair. Some of these grafts break down again, especially if adherent to bone, but on the whole it is an effective method of dealing with one of the main scourges of this part of the world.

Malignant ulcers are treated by amputation, below-knee if possible so as to give a short kneeling stump suitable for a simple peg-leg prosthesis.

Acute Infection

Acute staphylococcal osteomyelitis is probably more responsive to penicillin than in the United Kingdom. Septic arthritis of the hip in infancy is fairly common, the baby presenting with a large gluteal abscess and often a dislocated hip. Both these conditions may go untreated in the acute phase and present some years later with a deformity or persistent sinus.

Acute arthritis in adults, especially of the knee, is common, the pus often being sterile. A recent history of gonorrhoea is sometimes obtained and the arthritis subsides with aspiration and penicillin injections.

A sudden onset of fever, bone pains, and leucocytosis is not always due to osteomyelitis but may be caused by sickle-cell anaemia or haemoglobin SC disease.

Chronic Infection

Although few patients are seen with acute osteomyelitis, the sequelae are common and patients with multiple discharging sinuses and sequestra involving whole shafts, sometimes of several bones, often come for admission. The surgical treatment is most rewarding. The technique used whenever possible is sequestrectomy and primary closure. Through a long incision, with excision of the sinus tracks, a sequestrectomy and very thorough saucerization are performed. Often only the deep layer of the involucrum is left. This reduces the girth of the limb and allows the skin to be closed. It also obliterates the dead space except at the ends. Every few days after closure penicillin and streptomycin are injected into the wound at each end to reduce infection of the haematoma until it organizes. With this method it is often possible to obtain primary healing.

The guinea worm (*Dracunculus medinensis*) is a parasite which infests the soft tissues, especially of the lower limbs, causing chronic abscesses and sinuses. The knee-joint may become secondarily infected; this leads to a fibrous ankylosis with a flexion deformity which is best treated by arthrodesis.

Mycetoma (maduromycosis) of the foot occurs in Northern Nigeria. The patient usually comes to hospital in an advanced state of infection, with involvement of all the tarsus, severe fibrosis of the foot, and multiple discharging sinuses for which amputation is necessary.

Other Chronic Infections.—Syphilis is fairly common, but bony changes are not often seen. Yaws, although apparently common in the coastal belt of Nigeria, is rare in the north. Leprosy, with its neurological and

trophic manifestations, occurs throughout Nigeria, but all cases in Kano go to a leprosarium and few are seen in the orthopaedic department.

Tuberculosis

Bone and joint tuberculosis, although common, is not an overwhelming problem and it is usually possible to admit all active cases.

Spinal caries may present as a paraplegia with no symptoms referable to the back, and sometimes radiographs show no obvious lesion at first. Treatment of spinal tuberculosis has been mainly conservative. There appears to be a greater tendency towards healing with bony fusion in the African than in the European. The usual method of immobilization is bed rest combined with a plaster jacket, or a jacket-spica for a lumbar lesion. Plaster beds are sometimes used, but they require skilled nursing and it is difficult to persuade Nigerians to stay in them.

If the paraplegia shows no recovery after two weeks' conservative treatment the abscess compressing the cord is evacuated by costo-transversectomy with very good results. Antero-lateral decompressions are seldom required.

Tuberculosis of the hip is seen both in the active stage and after spontaneous healing with fixed deformity. Because of the tendency to bony fusion, conservative treatment is employed at first. Traction or a plaster spica with wedging often corrects a severe flexion deformity. In cases where the hip has been irreparably destroyed and there is no progress towards bony ankylosis, an arthrodesis is performed. This policy inevitably prolongs the period in hospital of some patients who would have done better with early arthrodesis, but it saves others from an unnecessary operation and eases the load of an understaffed operating-theatre. For hips ankylosed in flexion and adduction a simple subtrochanteric osteotomy with plaster fixation is adequate.

Poliomyelitis

This is common, particularly in children under 3 years of age. The young child with flail lower limbs presents a very difficult problem. Often he has been brought hundreds of miles for treatment. It is seldom possible to admit the infant owing to the shortage of beds; this is further complicated by breast-feeding, which is continued to the age of 2 to 3 years. The best that can be attempted is supervision to prevent contractures, and perhaps plaster splints or callipers may be provided. The child can get no skilled aftercare at home and regular re-examination is prevented by distance and poverty.

However, not many patients seek treatment for the late effects of poliomyelitis. I did not see any case suitable for tendon transplantation and few in whom lower-limb stabilization was carried out. This is mainly due to the stoical nature of the Hausa. Paralysis or contracture which does not interfere with simple activities will be accepted without complaint and he will be unaware that surgery can help him.

Beggars with withered and grossly contracted legs are often seen in the streets. They keep away from hospital, as they do not want to lose their livelihood.

Other Conditions

Congenital Deformities.—Congenital dislocation of the hip is almost unknown in the Nigerian. This may be due to the mothers keeping their infants lashed to their backs with the babies' hips widely abducted and flexed. Club-foot is about as common as in Britain, and abnormalities such as absence of the tibia, radio-ulnar synostosis, polydactyly, and syndactyly occur occasionally.

Dietary Factors.—Although the poorer people live almost entirely on starchy foods, there is little gross undernourishment in the northern region, and deficiency diseases affecting the skeleton are rare. Rickets seldom occurs, as young children run around naked and get plenty of sunshine. A few cases of severe rickets in older children which I saw responded to large doses of vitamin D. Genu valgum, not associated with rickets, is an extremely common condition, and it tends to be more severe and progressive than it is in England. Supracondylar osteotomy is frequently indicated. Adults with gross osteoarthritis after untreated genu valgum are sometimes seen.

Degenerative Conditions.—Degenerative arthritis is not a large problem in Nigerian hospitals. Rheumatoid arthritis must be exceedingly rare. Occasional cases of ankylosing spondylitis and infective polyarthritis occur. Osteoarthritis, apart from the post-traumatic variety, is not often seen. Possibly many people suffer from it but do not go to hospital, joint stiffness and aching being accepted as a consequence of growing old. Chronic backache and foot deformities, which bulk so largely in orthopaedic out-patient work in Great Britain, are almost unknown in Nigeria.

Tumours.—In such rare conditions as bone tumours one person's experience in one tour is of little significance. Adamantinoma of the mandible appears to be a relatively common tumour, as I saw four cases which were treated by resection of the affected part of the jaw.

Kano Orthopaedic Hospital

The new hospital is intended to be an example not only to Northern Nigeria but to the whole of Africa. The design and construction of the buildings are excellent and the equipment and furnishings of a very high standard (Fig. 4).

It was designed as a 150-bed hospital with six wards, connected by covered ways. Owing to shortage of money and staff, only two 25-bed wards have so far been built. The theatre unit is air-conditioned and includes two large operating-rooms and an autoclave sterilizing plant. The x-ray department adjoins the

FIG. 4.—Entrance to Kano Orthopaedic Hospital.

theatre. Steam for the theatre and for the modern kitchen and laundry is provided by an oil-fired boiler. The physiotherapy department has a large and well-equipped gymnasium. There are also office blocks, library, pharmacy, out-patient department, and lecture rooms. A central store and limb-fitters' workshop will be built in the next 12 months. Houses for the senior and junior staff are pleasantly situated in the grounds of the hospital.

The two wards so far built are for male patients only. In this predominantly Moslem community the woman's place is in the home and she seldom ventures out of it. It was not possible to give up one of the two wards to the few women patients, and they were therefore treated at the City Hospital.

The nursing staff at the hospital consists of the matron and one sister, seconded from the Royal National Orthopaedic Hospital, and eight male Nigerian staff nurses, trained in local hospitals. There are three shifts a day to provide cover for the two wards and help in the theatre as necessary. Each nurse has one day off a week, and usually one is away on leave, so the hospital is not overstaffed. There are at the moment no nurses in training, but there are labourers who help with the ward work. The first ward was opened in March, 1959. At that time the steam installation and the theatre were not complete and so all operating was done at the City Hospital. In July the second ward was opened and steam was raised in August. Building work in the theatre continued and operating was not possible until October. Their Royal Highnesses the Duke and Duchess of Gloucester visited the hospital in May, 1959, and on December 21 the hospital was officially opened by the Emir of Kano.

The present policy of the orthopaedic unit is to continue to treat patients with acute injuries and female orthopaedic cases at the City Hospital, and to use the new orthopaedic hospital mainly for uninfected orthopaedic cases and for tuberculosis. It is hoped soon to run a course for staff nurses and to award an orthopaedic nursing certificate. This will necessitate increasing the establishment of nurses, which should ease the running of the hospital. It is also proposed to take African registrars from the University College Hospital, Ibadan, for short periods of training. The hospital will then be fulfilling one of its main functions, which is the preparation of the Nigerians to take over the running of their own medical services. However, so far as the Northern Region is concerned, it will be many years before they are able to do this, and meanwhile the expatriate has a most useful part to play.

Conclusions

My period of secondment to Kano has offered me wonderful experience and responsibility and has been well worth while. It has been a privilege to work with the Northern Nigerians, with their admirable qualities of patience, fortitude, and good humour. I owe a great deal to Mr. Bryson, whose stimulating energy and friendship made my tour a most happy one.

I hope that this article may stimulate interest in this and other secondment schemes. With the general trend towards independence, expatriates are somewhat unwilling to embark on a life's work in these countries, where in one or two decades they may find themselves regarded as redundant. The seconded medical officer is a less useful person than the man who devotes the best years of his life to work overseas. But he can do a valuable job. He also has a splendid opportunity to get to know other parts of the world, and he gains immensely in experience. At the same time he does not lose his place in the National Health Service.

I am indebted to the Royal National Orthopaedic Hospital for granting me this appointment.

I thank Mr. H. J. Seddon for his help, and Miss P. Hayer for some of the photographs.

POSTGRADUATE MEDICAL SCHOOL OF LONDON

PRIME MINISTER OPENS WOLFSON INSTITUTE

On May 3, before a large assembly sparkling with the brilliant scarlets of doctors' robes, Mr. HAROLD MACMILLAN declared open the Wolfson Institute, a new and striking building of the Postgraduate Medical School at Hammersmith Hospital. The Institute, which the School owes to the great generosity of the Wolfson Foundation, will be a notable addition to the School's amenities for the large number of doctors, particularly from the Commonwealth, who come to study there. The Institute contains three lecture theatres, seating respectively 490, 150, and 60 persons, a large dining area, which can also be used for dances, a doctors' club, common-rooms, a medical engineering department in the basement, and a caretaker's flat on the roof. The architects were Messrs. Lyons, Israel, and Ellis.

Both Mr. and Mrs. ISAAC WOLFSON were present at the opening ceremony.

[R. J. A. Rose, London N.W.]

The Wolfson Institute, showing the main entrance.