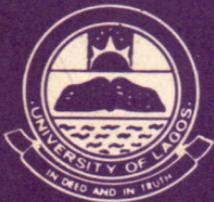


THE DENTIST IN AFRICA

BY
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THE DENTIST IN AFRICA

An Inaugural Lecture delivered at the University of Lagos
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Introduction

An inaugural lecture provides an opportunity for a professor to give the university community and the public an account of his stewardship. It may in fact, be looked upon as a debt owed to the university for being elevated to a chair.

If the lecture is given soon after appointment as professor, it should literarily be the first lecture in the new position, and therefore there would be the tendency to justify the new appointment in the course of the lecture. Apart from expounding on his area of specialisation, the professor invariably attempts to explain, as much as possible in simple terms, his contribution to knowledge.

On the other hand if, as it is in my own case, the inaugural lecture is being delivered six years after appointment as professor, when the euphoria of the new position has waned, it becomes apparent that there may be many more challenges in the academic career than the modest contribution to knowledge that formed the basis for elevation to professorship. The task of an inaugural lecture becomes even more onerous for me because of my brief experience as Deputy Provost of the College of Medicine, University of Lagos. My position as current National President of the Nigerian Dental Association does not lighten the burden.

Mindful, therefore, of my responsibility to the public, the academic community and to my professional colleagues, I have chosen to speak on the plight of the dentist in Africa. What does the public expect of him? What are his aspirations? To what extent is he equipped to meet the challenges of society? What are his contributions to his country and, indeed, to mankind? In attempting to answer some of these questions, I shall draw on my limited experience, bearing in mind that I merely occupy the chair of Restorative Dentistry.

Until about two decades ago, most dental surgeons practising in Black Africa obtained their professional training abroad, mostly in Europe and North America. Most of the dentists in Africa were therefore Europeans, Asians or North Americans; but there were a few privileged African dentists. With the establishment of the dental schools in a few countries in Black Africa, there has been a gradual increase in the number of indigenous dentists in the continent. The dental school in Lagos, established in 1965 under the leadership of Professor John Fox-Taylor was the first of the dental schools in Black Africa, and I happen to have been the first Nigerian full-time academic staff of the dental school. There are now dental schools in Abidjan in Ivory Coast, Dakar in Senegal, Khartoum in Sudan, Nairobi in Kenya and in Dar-es-Salaam in Tanzania. In Nigeria, apart from Lagos, there are also dental schools at Ibadan, Benin, Ife and more recently Enugu.

Thus the dentist in Africa referred to in this lecture may be an African or an expatriate trained abroad or in Africa. Of course, there had for many decades been dental schools in South Africa and in the North African countries such as Egypt. My account of the dentist in Africa does not relate to these countries, but will be limited to Black African countries, exemplified by Nigeria.

Apart from the Western-trained dentists, the African traditional healers have contributed to the practice of dentistry in Nigeria. Not infrequently, some of these traditional healers extract loose teeth. They also apply herbal extracts to painful teeth. Sometimes, the traditional healer who removed loose teeth, performed circumcision, inscribed tribal marks on the face and other parts of the body and, just like the ancient European barber surgeon, also shaved the head (Hollist, 1985). It is not uncommon to find traditional practitioners who file mesial incisal angles of maxillary central incisors to create a central diastema which is regarded as a sign of beauty especially in the African females. Although Uli Beier, a novelist, described traditional healers who replaced

missing teeth with carved pieces of bone (Austen-Peters, 1973) the practice of restorative dentistry is seldom undertaken by African traditional healers. In this lecture, the African traditional healers will be excluded from my description of the dentist in Africa.

The history of modern dentistry in Black Africa may be exemplified by our experience in Nigeria. Pearson and Cunningham were the earliest qualified dentists to have offered modern dental services in Nigeria from 1935 to 1938, when the country was a colony of Britain. The number of dental cases seen in the various hospitals in Nigeria during this period was 1,858 of which 55 per cent were expatriates, while the remaining 45 per cent were Nigerians (Austen-Peters, 1973). This is not surprising because the dental services in most of the African countries were essentially designed to meet the needs of the colonial masters, including the colonial armed forces.

In 1946 the staff situation improved, with five Government dental officers in Nigeria. Bi-weekly dental clinics began at the 'African Hospital' in Lagos and in-patient beds were allocated. The gradual increase in the number of dentists in Nigeria is shown on Table 1

Apart from one or two Nigerians who qualified as dental surgeons in the 1940's, it was not until the middle of this century that Government awarded scholarships to enable Nigerians study dentistry as an integral part of national manpower development.

Table 1. Number of dental surgeons in Nigeria

Year	No. Dentists
1935	2
1946	5
1951	10
1961	68
1976	168
1980	285
1984	773

Image of the Dentist in Africa

Although dentistry has been practised in different parts of the world for many centuries, it became recognized as a profession in Europe and North America only during the first two decades of this century. In fact, the General Dental Council came into being in the U.K. as recently as 1957. In Nigeria, dentists' names appear in the same Register as those of medical practitioners, but in a separate section of the Medical and Dental Register published by the Nigeria Medical Council. The same applies to dentists in most countries in Black Africa.

As a health profession, dentistry is obviously intimately related to the medical profession. It is therefore not surprising that the dentist in Africa is sometimes looked upon as a medical specialist, similar to an otolaryngologist or an ophthalmologist. Indeed, this is the situation in some European countries where medical doctors specialize for about two years to become dental surgeons or stomatologists.

To some others, the dentist in Africa is no more than a technician, especially if their experience of the dentist is in the easing of a tight denture or adjusting a gold inlay at the chairside. This impression is strengthened if the observer has had some experience of the unqualified dentist.

To yet some others, the dentist in Africa is looked upon as a paramedical personnel or medical auxiliary who carries out the physician's prescription.

To most Africans, the dentist is a person whose sole function is to extract teeth and replace them with plastic dentures, because they have never seen him practise other aspects of dentistry. There are however a few people who expect the dentist in Africa to also play the role of a physician.

Challenges for the Dentist in Africa

To make dental practice in Africa relevant to the dental needs of the continent, it is important that the dentist in Africa establishes the dental disease pattern in the communities, and this requires epidemiological studies.

Epidemiology may be defined as the study of those factors which influence the occurrence and distribution of health, disease, defect, disability and death in a population. Thus the scope of epidemiology has gone beyond the etymological meaning – the study of epidemics.

There are at least two basic types of epidemiology. Descriptive epidemiology is concerned with the distribution of a disease condition in the population. Descriptive dental epidemiology is essential in most African countries because the base-line data obtained therefrom are invaluable in the planning and evaluation of preventive and therapeutic dental health services.

In analytical epidemiology, however, an attempt is made to test a hypothesis. In this type of study, the epidemiologist seeks to discover factors and mechanisms associated with the distribution and prevention of a disease.

In the Department of Restorative Dentistry, we felt the need for both descriptive and analytical epidemiological studies. Apart from obtaining base-line data, we were interested in explaining our clinical observations and impressions which were at variance with the expectations of those of us who had our professional training in Western countries. Among the observations that triggered my curiosity were the eruption times of permanent teeth, the pattern of dental caries, and enamel opacities.

Unlike the dental researcher from abroad, who makes a brief visit to Africa, the dentist in Africa is in a better position to study the pattern of oral diseases in Africa, and make meaningful inferences. This is because he has a better understanding of the African society, culture and habits. To illustrate this point let us consider some of our studies.

Eruption times

As far back as 1919, Suk reported that the dates of eruption in Zulu children were appreciably earlier than in Caucasians in America and Europe; and more recently, Houghton et al (1967) reported that teeth seemed to erupt about a year earlier in the Brong Ahafo region of Ghana. Apart from the wisdom teeth which, from clinical experience, appeared to erupt earlier in Nigerians, I was not certain of the earlier eruption of the other teeth.

To clarify this problem, eruption times of 4–16 year olds were studied in populations sampled from Lagos, Ilesha and Imesi-Ile. Only those children whose ages were authenticated by birth certificates in Lagos were included in the sample. At Ilesha and Imesi-Ile, the Methodist missionary had recorded most of the births since 1957. The ages of the children from these areas were therefore supported by such records. It was vital to authenticate the ages of these children because of the difference that often exists between chronological and official age in this country (Akpata, 1971).

It was concluded from this study that there was not much difference between eruption times of permanent teeth of Nigerians and Caucasians.

In another collaborative study involving Richardson from Ireland, Franklin from Togo and Ana from Nigeria, we made a direct comparison between eruption times in Togolese and Irish children. For logistical reasons, only the permanent central incisors and permanent first molars were included in the study. We found that there was no statistical difference between the eruption times of the incisors, but that the molars erupted about 6 months earlier in the Togolese, and this difference was statistically significant.

It might be argued that the discrepancy between the eruption ages of incisors and molars is evidence of separate genetic clocks for incisor and molar teeth, with one gene or a combination of genes acting in the incisor region and another acting in the molar region. We thought that this was

improbable because in any individual the eruption of the teeth must be closely correlated in order that the occlusion of teeth should develop in the best possible way. Added to this was the clinical finding that individual patients either erupt all their teeth early or all their teeth late. Thus, we believed that the whole dentition is under the control of a single genetic clock or, at least, separate clocks that are closely correlated.

A more likely explanation for this discrepancy is that there is an element of crowding in the molar region in Caucasians but not in West African children.

We therefore concluded that there are only small differences in the genetic timing of tooth eruption in West Africans as against the Caucasians and that an element of crowding may delay the eruption of molar teeth in Caucasians (Richardson *et al.* 1975).

In all probability, the earlier tooth eruption that had been widely reported in Africans was simply due to the fact that the dental researcher who paid a brief visit to Africa was unaware of the difference between chronological age and official age in many African countries. For instance, if 7 or 8 year old pupils declare that they are aged 6 years so as to qualify for admission into the primary school, eruption times based on such subjects would obviously be early — a pitfall for the occasional dental researcher to Africa.

Pattern of Dental Caries

The management of dental caries and its sequelae occupies a significant part of the professional life of a dentist. Caries experience in a community is usually measured by the DMF index which is the mean of the total number of decayed (D), missing (M) or filled (F) teeth in a community.

As a dentist in Africa who received his professional training in the UK, I found certain aspects of caries distribution in our Nigerian patients most intriguing, particularly the caries vulnerability of the first and second permanent molars.

An epidemiological study of caries distribution in Lagos revealed that the prevalence of decayed, missing and filled second permanent molars is approximately twice that in first permanent molars (Akpata and Jackson, 1978). This contrasts with observations in Western countries. As first permanent molars erupt six years earlier than second permanent molars, the pattern of caries distribution in Lagos would appear to be anomalous. You will observe from Fig. 1 that the second permanent molar is carious, while the first permanent molar is caries-free.

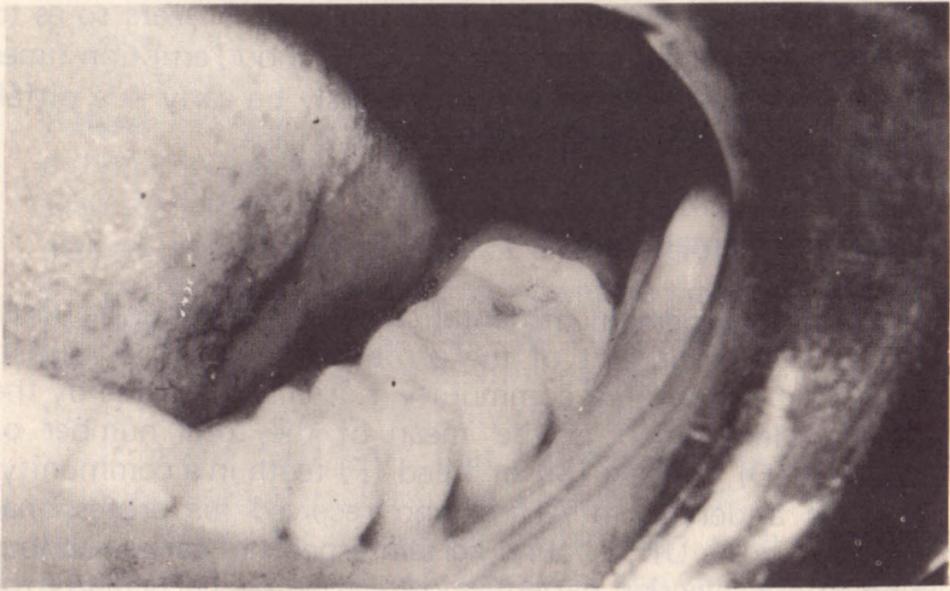


Fig. 1 — The second permanent molar is carious while the first permanent molar is caries-free.

A caries distribution pattern in first and second permanent molars similar to that observed in Lagos has also been reported in Uganda (Jensen *et al.* 1973) and Zambia (Westwater, 1977).

It is significant that caries prevalence differed mainly in Lagos subjects with DMF values of 5 or below, i.e. those with low caries experience. In subjects with higher caries experience, almost equal numbers of first and second permanent molars were carious, missing or filled, as can be seen in Fig. 2

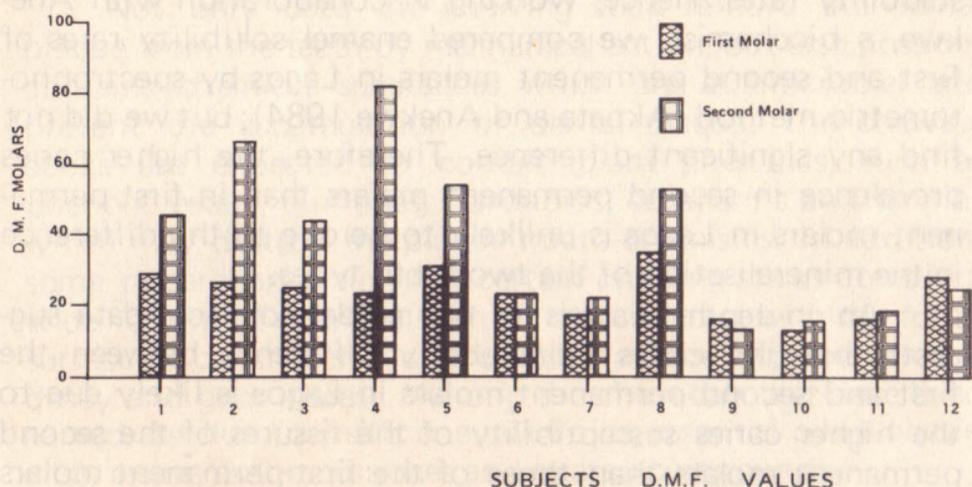


Fig. 2 — Histogram showing caries of the first and second permanent molars in subjects with varying caries experience, measured by D.M.F. index.

In other words, first permanent molars are more resistant to caries than second permanent molars in Lagos. It can therefore be inferred that caries of the first permanent molar at an early age is an indication of future caries experience: either the patient's teeth are highly susceptible to caries or the patient's diet and/or oral environment are highly cariogenic. Caries preventive measures, such as the application of fissure sealants, should therefore be instituted for such patients. Hence this caries vulnerability difference could be a most important diagnostic tool for the selection of Africans at risk and requiring caries preventive measures.

This is an example of the way in which the clinical observation by the dentist in Africa, if investigated, may go a long way to influence dental practice in the continent.

It has been suggested in European dental literature that the first permanent molar is more resistant to caries because it mineralises during the period of breast feeding, whereas the mineralisation of the second permanent molar takes place at three years of age when the African child is malnourished (Westwater, 1977).

Thus, it may be reasoned that this apparently anomalous caries distribution pattern is due to some nutritional factors influencing the mineralisation of the two tooth types; if this is true, such factors are likely to be reflected in enamel solubility rates. Hence, working in collaboration with Anekwe, a biochemist, we compared enamel solubility rates of first and second permanent molars in Lagos by spectrophotometric method (Akpatha and Anekwe 1984); but we did not find any significant difference. Therefore, the higher caries prevalence in second permanent molars than in first permanent molars in Lagos is unlikely to be due to the difference in the mineralisation of the two tooth types.

An in-depth analysis of our epidemiological data suggests that the caries vulnerability difference between the first and second permanent molars in Lagos is likely due to the higher caries susceptibility of the fissures of the second permanent molars than those of the first permanent molars (Akpatha, 1981).

We have therefore attempted a microscopical study of the fissure morphology of the first and second permanent molars in Nigerians. From our preliminary results, it would appear that pits and fissures in second permanent molars are generally deeper than those of first permanent molars.

Oral Hygiene In Africans

The most prevalent dental disorders are dental caries and periodontal disease. These dental conditions are possibly caused by micro-organisms lodged in the dental plaque which is an agglomeration of cocci, bacilli and filamentous micro-organisms in a mat of polysaccharide matrix adherent to the tooth surfaces.

To prevent gum disease and tooth decay, therefore, one of the strategies adopted is to remove dental plaque by oral prophylaxis. In Western countries, this is achieved by the use of the tooth brush and tooth paste, but in most African communities and some parts of Asia, the chewing stick is used. *Salvador persica* is one of the plants most popularly used as a chewing stick. It is grown along the sea-coasts of East Africa, Arabia, Iran, Syria and Western India. The woody stem of this plant is easy to crush, and dry pieces of the root soon swell and soften in water.

In Nigeria, however, among the plants popularly used as chewing stick are *Fagara zanthoxyloides* (known as Orin Ata in Yoruba), *Vernonia amygdalina* (Ewuro), *Garcinia kola* (Orogbo), *Anogeissus schimperi* (Pako Dudu) and *Massularia acuminata* (Pako Ijebu).

Not only does the chewing stick remove the dental plaque from the teeth by mechanical action, but also possibly contains chemical substances which are antimicrobial and prevent the accumulation of dental plaque. The chewing sticks are expected to contain plant phenolics, such as phenolic esters, quinones, flavonoids, coumarins and tannins which may destroy the plaque micro-organisms. In addition, some researchers claim that certain chewing sticks contain a wide variety of chemicals which may interact with the tooth surface or constituents of the dental plaque to prevent tooth decay and gum disease. Among the chemicals that have been named are fluoride, silicone, alkaloids, essential oils (volatile oils), resins, anthraquinones and related compounds.

It has been reported more recently that there have been demands by pharmaceutical industries in Europe for extracts of the chewing stick, *Salvador persica* for use in the manufacture of tooth pastes.

Chewing stick research has therefore been of great interest to me because of the widespread use of the African chewing stick in the continent and its potential for plaque removal.

Our work (Akpata and Akinrimisi, 1977) in the Departments of Restorative Dentistry and Biochemistry at the College of Medicine of this University has demonstrated that aqueous, isobutanol and benzene extracts of the five popular African chewing sticks I have already enumerated will inhibit

the growth of some plaque micro-organisms. From this work, we were able to conclude that the active principles in the various chewing stick extracts are not the same, and that the extract from a given chewing stick is chemically heterogeneous.

Although the African chewing stick can remove dental plaque by mechanical action and possibly by inhibiting the growth of plaque micro-organisms by chemical action, we must admit that our scientific knowledge of the chewing sticks is still rather limited, and our claim of its efficacy in the prevention of dental caries and gingivitis must await successful clinical trials.

Endogenous Factors And Dental Conditions

Most dental diseases and anomalies are due to environmental factors. For example, there is a high degree of correlation between caries experience and the frequency of consumption of refined carbohydrates, especially when the sugar is sticky and eaten between meals (Zita, Macdonald and Andrews, 1959). Just as in other parts of the world (Loe, Theilade and Jensen, 1965; Lovdal, Arno and Waerhang, 1958), we have observed a positive correlation between the prevalence of dental plaque and gingival health in Nigerians (Akpata, 1979). Furthermore, the level of fluoride in drinking water is higher in the areas of Uganda where there is endemic dental fluorosis (Moller et al, 1970). These are some examples in which environment plays a significant role in the aetiology of the various dental diseases and anomalies.

But there are a number of dental conditions in which factors, other than environmental, may play a major role in their aetiology. One example is possibly the caries vulnerability difference between first and second permanent molars in Africans which has already been discussed at great length. Another possibility is alveolar bone loss which we have observed to be age-related in Lagos (Akpata and Jackson, 1979), although rapidly progressive periodontitis has been suggested to be due to abnormal neutrophil chemotactic activity.

In the case of enamel opacities, Dean's classification implied that most, if not all, enamel opacities are caused by dietary fluorides. But in our studies in Lagos (Akpata and Jackson, 1978), the right-left symmetry of mottled incisors occurred in only approximately a third of the affected persons. If enamel mottling is mostly due to dietary fluorides as implied by Dean's classification, mottled permanent incisors would be expected to be symmetrically distributed, because all incisors that mineralise contemporaneously should be equally affected. Indeed, incisors with enamel fluorosis in East Africans are symmetrically distributed.

Although trauma to primary predecessors and exanthematous fevers may contribute to the aetiology of mottled enamel, these factors alone provide inadequate explanation for the lack of ethnic and geographic variation in the prevalence of mottled incisors in non-fluoride and optimally fluoridated communities. Rather, there may be intrinsic factors which influence the activity of ameloblasts, resulting in some of them laying down defective enamel diagnosed clinically as mottled enamel.

Malocclusion is another dental anomaly that is due mainly to genetic factors, but premature loss of deciduous teeth, failure to replace missing permanent teeth and abnormal habits such as thumb-sucking may be contributory.

Thus, a number of dental diseases and anomalies may be due to endogenous factors, but most of them are complicated or aggravated by environmental influences which may be mitigated or eliminated by preventive measures. When the preventive measures fail, restorative dental care may then have to be instituted.

Restorative Dental Practice In Africa

As a Professor of Restorative Dentistry, restorative dental practice in Africa has obviously agitated my mind for a long time.

Restorative dental practice in Africa is influenced by a number of factors namely, the pattern of dental disease, dental manpower, demand for dental services, socio-economic factors and the national health policy.

Because of the shortage of dental manpower in Africa, the work-load is usually quite heavy for the dental personnel who may therefore not always be in a position to offer the ideal dental services. Whereas the ratio of dentist to population is 1:3,000 in the UK and 1:800 in Sweden, it is 1:137,000 in Nigeria. To compound this problem, the facilities for dental treatment are in short supply. Consequently, the dental restorative index is low in most African countries, especially as there is generally a low level of dental awareness in these communities. For example, the restorative index (a measure of restorative dental care) for 21-year olds in Lagos is approximately 17 per cent (Akpatá, 1977), as compared with a figure of over 89 per cent in North American whites (Jackson, 1974).

As a result of the low level of economic development in most African countries, a good number of patients cannot afford to pay for sophisticated restorative dental treatment. Nevertheless, it should be remembered that most urban African communities are heterogeneous, those in abject poverty living side by side with a few citizens who live in affluence and opulence and who can afford to pay for and, indeed, request the most sophisticated forms of restorative dental care.

Furthermore, the national health policy influences the demand for restorative dental services. Where Government offers free health services, there is a greater demand for restorative dental care, especially in the urban areas where the few dentists in Africa are concentrated. Thus, we experienced during the second Republic in this country an upsurge in the demand for restorative dental care in certain parts of this country where health services were expected to be free.

In view of the various constraints to the practice of restorative dentistry, should we fold our arms until the conditions for practice are ideal? Obviously the answer is No! I believe that as a professional, the dentist in Africa should be able to rise to the challenge and provide as much dental services as are practical under the prevailing conditions. He must identify operative techniques that do not require very sophisticated equipment. Such aspects of therapeutic

dental health services could be practised in a primary dental health centre which should be located in each of the local government areas of the country, while those aspects requiring the use of more sophisticated instruments are undertaken in well equipped dental surgeries in health centres as well as in general, specialist and teaching hospitals.

Let us illustrate this concept with the management of fractured incisors, a condition we have observed to be prevalent in nine per cent of Nigerians (Akpata, 1969). If the fracture involves a substantial part of enamel and dentine without the involvement of the dental pulp, the clinical crown could be restored with etch-retained composite filling materials. This can be done with minimum instrumentation, making the technique feasible under the primary dental health setting where rotatory cutting instruments may not be available. This approach has a number of advantages. Firstly, it ensures that rural dwellers who constitute about 80% of the African population will benefit from restorative dental care, under the primary dental care setting, with judicious use of dental auxiliaries. Secondly, it will lead to the emergence of an organisational structure that is in harmony with the organisation of health services in most African countries.

Endodontic Research

Because of the scarcity of research funds in the continent, the dentist in Africa wishing to carry out laboratory-based research must devise experimental models that do not require expensive or sophisticated instruments or equipment. The main stimulus for laboratory-based endodontic research in our department has been the shortage of dental materials for endodontic practice. The effect of endodontic procedures on the microbiological status of the root canal has therefore been evaluated. Furthermore, the conventional antimicrobial intracanal medicaments became unavailable in our clinics some years ago, and we were interested in evaluating substitutes.

A quantitative method for evaluating the bacteriological status of the root canal was developed as this would be more objective than many qualitative methods reported, such as the use of paper point inoculations, and the number of visits to obtain negative cultures (Atkinson and Hampson, 1964). An in vitro method for estimating the total viable counts of micro-organisms in infected canals was developed in our laboratory using non-sophisticated equipment (Akpata, 1974). Teeth sterilised with ultraviolet light were macerated in the diamond mortar (Fig.3) and the suspension of tooth particles cultured on agar plates.

Using this technique, it was possible to demonstrate that enlarging the root canal to at least three sizes above the instrument that begins to bind to the unprepared canal wall, together with liberal irrigation of the canal with saline would disinfect the root canal significantly (Akpata, 1976).

The realisation that adequately performed biomechanical preparation would disinfect the root canal has allowed us to carry out root canal therapy without cultures. Also this work provides a scientific basis for similar practice in other dental centres.

Many endodontic cases seen in Nigeria have periapical involvement, including alveolar abscesses. The access cavity may be left open to drain the abscess. As the root canal walls are exposed both to oral microflora and micro-organisms from the abscess, it was of interest to find out how they invaded the pulpal dentinal wall.

Essentially, an experimental model was devised consisting of an extracted tooth inoculated with a test micro-organism and immersed in an appropriate culture medium in a petri dish (Fig. 4). It was evident that the radicular dentinal tubules may be invaded by micro-organisms in large numbers and the invasion was time-dependent (Fig. 5). This study suggests that extended exposure of the canal to oral flora may result in significantly increased microbial invasion. Consequently, it is advisable to leave the root canal open to drain for only as long as it is absolutely necessary.

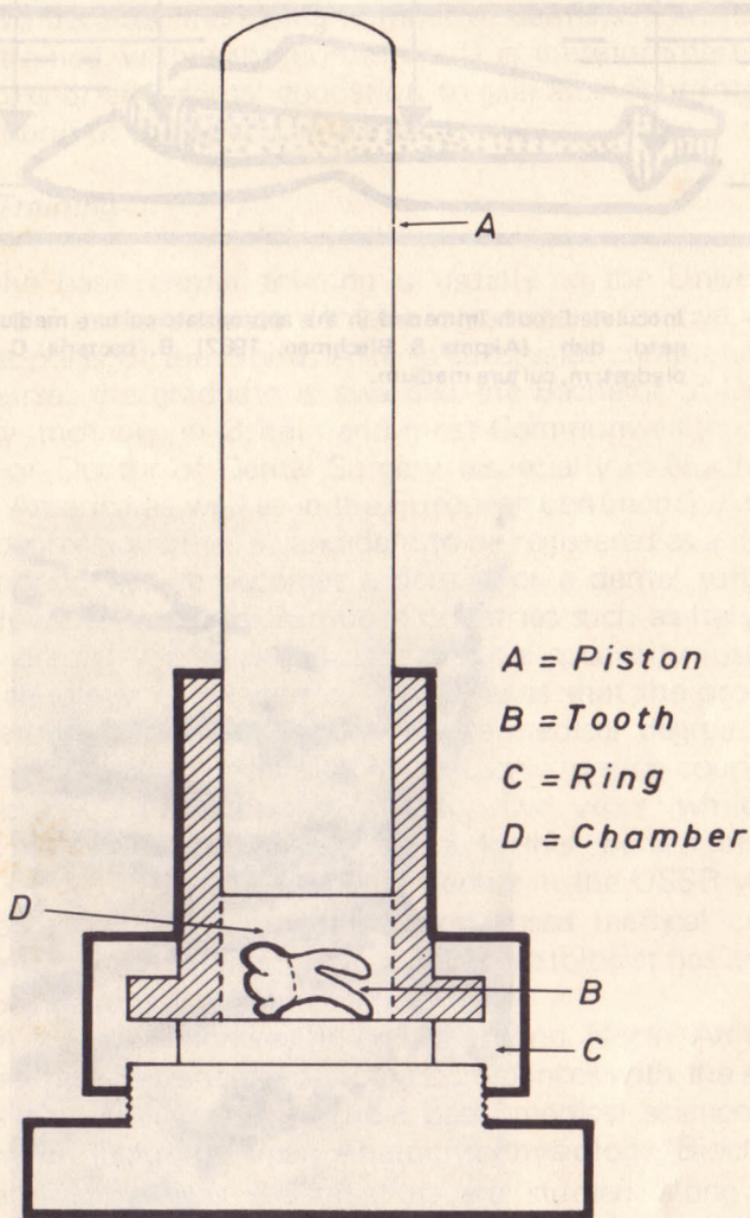


Fig. 3 — The diamond motár (Akpatá, 1974)

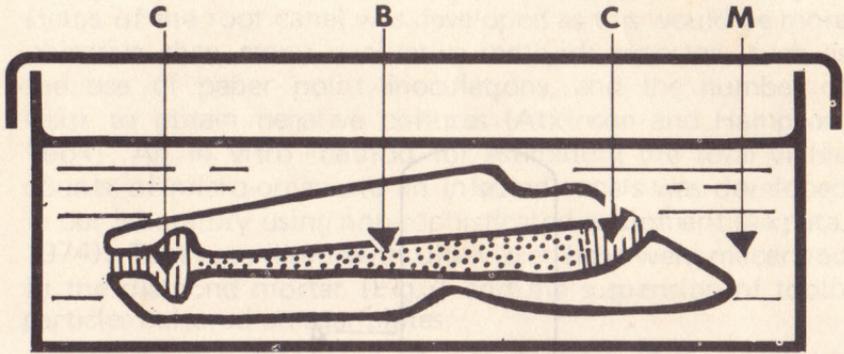


Fig. 4 — Inoculated tooth immersed in the appropriate culture medium in a petri dish (Akpata & Blechman, 1982). B. bacteria; C cotton pledget; m, culture medium.

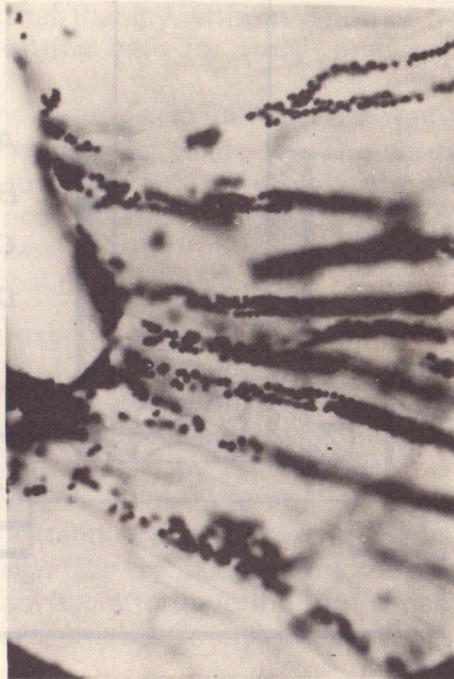


Fig. 5 — *Streptococcus faecalis* invading the pulpal dentine wall after two weeks of incubation of the inoculated tooth in yeast extract glucose broth (Difco) (Akpata, 1984).

Dental Education

It has been pointed out that the older dentists in Africa obtained their professional training abroad, but within the past two decades, increasing number of dentists in Africa are being trained within the continent. It is therefore pertinent to discuss briefly dental education to gain an insight into the background of the dentist in Africa.

Basic Training

The basic dental training is usually in the University where the undergraduate dental programme is for five years in most parts of the world. After a successful completion of the course, the graduate is awarded the Bachelor of Dental Surgery (notably in Britain and most Commonwealth countries), or Doctor of Dental Surgery (especially in North and South America as well as in the European continent). Any of these degrees qualifies a candidate to be registered as a dental practitioner, i.e. he becomes a dentist or a dental surgeon.

However, in some European countries such as Italy and Spain, dentistry is regarded as a medical speciality just like Ophthalmology or Obstetrics. This means that the prospective dental surgeon has to obtain the medical degree (MB. BS; or MD) before specialising in dentistry. In such countries, the medical course usually lasts for five years, while the specialization in dentistry is for a further period of two years. The situation is slightly different in the USSR where the dental student undergoes a condensed medical course with emphasis on stomatology. The stomatologist has an MD title, but he practises dentistry.

In the Commonwealth countries and North America, the undergraduate dental training commences with the study of basic medical sciences. These basic medical science subjects which include Human Anatomy, Physiology, Biochemistry and sometimes Biostatistics, are studied along with medical students. After the basic medical science training, dental students proceed to their clinical training which includes medical subjects such as General Pathology, Microbiology, Pharmacology, Medicine and Surgery. During the clinical training, emphasis is placed on the mastery of dental subjects

which include Preventive Dentistry, Operative Dentistry, Endodontics, Radiology, Oral Surgery, Periodontics, Prosthodontics, Paedodontics, Orthodontics, Oral Medicine and Science of Dental Materials.

The question that is often difficult to answer relates to the extent of clinical medical subjects that should be included in the dental curriculum. This question is particularly relevant for the dentist in Africa.

The dentist in Africa usually has a wide field of operation — he may be the only dentist over a hundred kilometre radius, especially if he is located outside a capital city. Therefore he must possess adequate knowledge, skill and attitude to manage most dental conditions, so as to minimise the need for frequent and, perhaps, unnecessary referrals. This means that the dentist in Africa should be proficient in most aspects of clinical dentistry, including oral and maxillo-facial surgery. In addition, he should be able to assess the general health of his patients and diagnose those medical conditions that are likely to influence or complicate the dental management, and take adequate precautions. Examples are haematological disorders, conditions that predispose to sub-acute infective endocarditis and those diseases that are prejudicial to the healing process, to name a few. In addition, the dentist in Africa should be highly skilled in the pre-operative assessment and the post-surgical management of his hospitalised patients. Furthermore, it needs to be realised that a person with a painless neoplastic lump on his head or neck may not care to see a physician, but he would quickly see a dental surgeon for severe tooth ache, even though unhappily. Therefore, it is very important that the dentist in Africa be able to recognise general medical or surgical conditions, such as a lump, so as to refer the affected patient to the physician for early management. In addition, the role of a dentist is invaluable in the early detection of oral cancer.

It is therefore apparent that the dentist in Africa needs to be more highly skilled in medicine and surgery than his counterparts in Western countries. Consequently, it has sometimes been argued that either the dental programme be lengthened beyond five years to incorporate more Medicine and Surgery or the dentist in Africa be doubly qualified,

possessing both the medical and dental degrees. These two options appear unattractive and unwise because it would take a longer time to train a dental surgeon than it takes to train a medical doctor. Furthermore, the standard of dental practice has come under severe criticism in countries where dentistry is a medical speciality, and this is because such specialists tend to be more inclined to oral and maxillofacial surgery, to the detriment, if not neglect, of the core areas of clinical dentistry. It therefore appears that the best option is that the duration of the dental programme in Africa should remain at about five years and approximately 20 per cent of the time for clinical training should be devoted to medicine and surgery relevant to the practice of dentistry.

Another contentious aspect of dental education in Africa is the extent to which dental students should be exposed to crown and bridge-work, in view of the fact that facilities for this aspect of restorative dentistry are not easily available in many government dental centres, particularly in the rural areas. In tackling this problem, we need to remind ourselves of certain facts. Firstly, it has already been pointed out that the prevalence of fractured incisors is quite high in Africans, being about nine per cent in 6–25 years old Nigerians (Akpata, 1969). If such traumatised teeth are not restored, they may result in the diseases of the pulp and periapical tissues as well as psychological ill-health. Although some of these fractured teeth can be restored with etch-retained composite filling materials on a semi-permanent basis, a crown is the ultimate permanent restoration.

Secondly, the prevalence of enamel hypoplasia is quite high, and many anterior jacket crowns done in Nigeria are as a result of this enamel defect or coronal fracture. This is more so in East Africa where severe enamel fluorosis is highly prevalent and results in severe cosmetic problems which can be solved by the provision of anterior jacket crowns. Thirdly, tooth mortality is relatively low in Africans and many of the patients with missing teeth have lost one or two teeth only; in such cases, a bridge is usually the prosthesis of choice because a removable denture would cause stagnation of dental plaque resulting in caries and periodontal disease of the standing teeth. Fourthly, as had been pointed out earlier,

African urban communities are usually quite heterogeneous, and therefore there are some citizens who can afford and, indeed, request the most sophisticated forms of restorative dental care, including crown and bridge-work. Lastly, it should be remembered that the dentist we are training today may remain in practice for the next 40 years, during which period there may be significant socio-economic development in the continent so that many Africans may then request sophisticated restorative dental care.

At the Lagos dental school and also in Benin where I have been a Visiting Professor, patients turn up to request crown and bridge-work. In addition, dentists in private practice in African cities have to provide anterior jacket crowns for many of their patients. All these go to demonstrate the need for the inclusion of most aspects of restorative dentistry in the dental curriculum in Africa.

If adequate facilities are not available, it is the duty of the dentist in Africa to educate those at the helm of affairs in the country to provide adequate facilities for the practice of all branches of dentistry. This does not deny the need to identify some aspects of dentistry that require minimum instrumentation for incorporation in primary dental health care, as I have already explained.

Teaching Dentistry In Africa

The teaching of dentistry is rather unique because the dental teacher is expected to guide his students to acquire knowledge, skill and attitude in the medical and dental fields as well as ensure that the students attain a high standard of manual dexterity. The dental sciences span both the biological and technological fields as they relate to dentistry.

To compound this problem, many African dental students have had no prior experience of dental operative procedures or previous knowledge of the various dental appliances, unlike their counterparts in Western countries.

To impart effectively the knowledge, skill and attitude required for the practice of dentistry, the dental teacher in Africa needs training in modern educational methods, particularly as most university teachers merely acquire ability to

teach by trial and error which proceeds at widely different rates from one individual to another (Sinclair, 1972).

The World Health Organisation and other international agencies have recognised this problem among health science teachers, and during the past two decades, have tried to provide formal exposure by means of workshops in educational methods to the teachers in various parts of the world, including Africa (Guilbert, 1974). One of the problems with international workshops is that the individuals who attend them often return to their institutions to find that they are unable to create in their colleagues, who did not attend similar workshops, a sympathetic attitude to the use of improved educational methods. Consequently, the impact of such internationally-organised educational workshops have not been significant in most institutions. Hence it was thought at the College of Medicine about seven years ago that workshops organised internally would be more effective in preparing a critical number of teaching staff required to bring about a real improvement in the quality of teaching (Elebute and Akpata, 1980).

The annual workshops to which we have been committed for over seven years have influenced teaching and assessment in dentistry at the College of Medicine of this University. Our evaluation of the workshop held in 1980 (Bamisiaye and Akpata, 1982) revealed that the workshop had positive impact on participants drawn from all departments in the College: after the workshop, most participants wrote instructional objectives, used more audiovisual aids and adopted new methods in the teaching and assessment of clinical skills.

Apart from the shortage of dental equipment and materials, one area of frustration for the dental teacher in Africa is the acute shortage of dental textbooks and professional journals in most African dental schools. In Nigeria, the situation has been worsened by the restriction on book importation by Government.

One obvious solution to the problem is for the dental teachers in Africa to write textbooks for their students, but this takes time and dental journals and other texts must be consulted while writing the textbooks. Because dental science

is international in nature, the dentist in Africa cannot afford to work in isolation. Not only is it essential for him to have access to international dental literature — books and journals — but also he should attend international dental conferences so as to keep abreast with the state of the art and science of dental practice. Obviously, Mr. Vice-Chancellor, sir, the same also applies to other university teachers in Africa. It is therefore important that Government reconsiders the restriction on book importation. This does not exonerate university teachers from writing textbooks tailored to the needs of their students.

Conclusions

The strategy and tactics for providing dental services as developed in the Western world may not be directly exportable to Africa. The onus rests on the dentist in Africa to evolve a dental health care delivery system relevant to the need and demand of the continent, and this must take into consideration the level and distribution of oral diseases and socio-economic factors in the affected community. The cadre and number of dental manpower required for the dental services would need to be determined. All these factors demand considerable epidemiological research which should preferably be carried out by indigenous personnel with intimate working knowledge of the socio-economic structure of the African community. The questions posed by epidemiological studies may then have to be elucidated by laboratory work, making use of inexpensive experimental models, where possible. Geographical mapping of oral diseases in the continent could search out the areas for further intensive study. In addition, periodic epidemiological studies in Africa are needed to identify secular changes in oral diseases, if any, and to make adequate preparation for the impact which these changes may have on the provision of therapeutic and preventive dental health services.

From the few epidemiological studies that have been carried out in Africa, oral diseases, particularly dental caries, are most prevalent in African children. Furthermore, occlusal anomalies are most amenable to orthodontic management in

childhood and adolescence. It is therefore logical that Government establishes school dental services in all local government areas in the country.

Mr. Vice-Chancellor, sir, the dental problems in the various African countries are similar. This was brought clearly into focus by the African delegates at the International Dental Conference organised by the Nigerian Dental Association in May, this year. The African nations must therefore make a concerted effort to solve these problems. The inauguration of the Federation of African Dental Associations at the 1985 Lagos International Dental Conference may go a long way in fostering the desired pan-African approach to the problems of dentistry in the continent.

Thus, it becomes very important that more vigorous efforts be made to translate into reality the proposed WHO Oral Health Demonstration, Training and Research Centre. It is nearly four years ago that the World Health Organisation approved that this Research Centre be sited in Nigeria, but very little seems to have been achieved in concrete terms. Knowledge accumulated at this proposed research centre would have a profound bearing on the practice of dentistry in Africa, as well as contribute to the advancement of dental science.

Finally, it should be clear from this short expose that the dentist in Africa is a pioneer, and must work hard to mobilise the populace and African Governments to achieve a high standard of oral health in the continent.

Thank you.

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