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Case Study.

SEVERE CERVICOFACIAL INFECTION OF DENTAL ORIGIN

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Objective: To highlight severe cervicofacial infection of dental origin as an important health problem in Northern Nigeria.

Method: This is a prospective control study of 26 patients (twenty six) with severe cervicofacial infection of dental origin managed at the maxillo-facial department of Ahmadu Bello University Teaching Hospital Zaria between January 2006 to December 2010

Result: Nineteen (19) of the twenty six patients were males and seven females; the age range is between 25 to 68 years. Nine (9) cases result from odontogenic causes while seventeen (17) occurred from post-operative dental complications.

Conclusion: Extraction from unqualified personnel (quacks) contributed immensely to the cause of severe cervicofacial infection of dental origin in this area

Keywords: Tissue spaces, abscess, antibiotics, Cervicofacial, Northern Nigeria.

INTRODUCTION

The diagnosis and treatment of severe cervicofacial infection represents a challenging problem to the oral and maxillofacial surgeon. These infections remain an important health problem with significant risks of morbidity and mortality, if the situations are not recognized it is likely to develop a life threatening condition in due time (Childs and Courville,1942; Adekeye and Adekeye,1982). The infection involving the orbit, zygomatic space, lateropharyngial space, the hemifacial and oral floor phlegmon, are the cervicofacial infections which when the diagnosis and or institution of an adequate treatment are delayed, can threaten the life of the patient (Adekeye and Adekeye,1982).

The occurrence of severe cervicofacial infection is more likely when the resistance of a patient is lowered by certain exhausting factors like stress, deficient nourishment, malaria, measles, parasite infections, anaemia, gastroenteritis, any debilitating illness, as well as by increased resistance of micro-organisms to usual antibiotics with wide spectrum (Daniel *et al.*,1983;Deji et al.,1989; Brook and Hirokawa,1989)

The infective process has a local expansive tendency through the infiltration and destruction of cervical tissues following the anatomic cleavage plans and an aggressive evolution with rapid deterioration of the general condition, jeopardizing the patient's life. The spread of the infection is encouraged by the natural connection between deep neck spaces, the infection being able to exceed the limits of the region and to invade the adjacent spaces.

With the availability of variety of antibiotics the development of new therapeutics schemes as well as the safety of surgical techniques, the incidence and complication rates of cervicofacial infection is decreasing especially when the medical surgical intervention is performed in due course (Adekeye and Adekeye,1982).

Local survey carried out however has shown an increase in cervicofcial infections of dental origin presenting to the Oral and Maxillofacial Surgery Unit of Ahmadu Bello University Teaching Hospital, Zaria, Kaduna, Nigeria. The total number of hospital admissions and bed space as a result of incision and drainage of cervicofacial abscess of odontogenic origin has greatly increased in the past 5 years. A prospective review of post-extraction, cervicofacial infections seen in our centre in the past 5 years that needed admission in addition to the above mentioned treatment modalities, is presented here with a view to checkmating the rise in the number of such cases.

MATERIALS AND METHODS

This prospective study was carried out at the maxillo-facial department of Ahmadu Bello University Teaching Hospital Zaria Nigeria, a referral Centre serving mainly the North Western and North Central regions of the country. Data collected from the patients included age, sex, date of onset of infections, site affected, tissue spaces involved, previous treatment and where obtained, type of treatment previously obtained locally or at the health centre.

The records of 26 (twenty-six) patients from January 2006 through December 2010, with history of attempted tooth extraction in peripheral hospitals were prospectively analysed.

The main criteria for incision were, infection involving four or more tissue spaces, compromised airway requiring immediate decompression of the floor of the mouth or treacheostomy, severe limitation of mouth opening (best opening being less than 5mm); need for parenteral antibiotics and admission into the ward.

Swellings arising from infected fractures, and skin lesious were excluded from this study. Also, patients that came in with tooth ache and swelling without prior procedure by a professional or unqualified personnel were excluded.

RESULTS

The study cases comprised 19 males and 7 females giving a ratio of 2:7:1, aged between 25 and 68 years with mean age of 34 years.

Their occupations are as follows:
In terms of job description, 14 patients were farmers, 5 were apprentices, traders were 7 in number and one low ranking military woman.

The causes of multiple space involvement were divided mainly into two-odontogenic and postoperative. We used the term odontogenic in cases originating from infection of the pulpal, periodontal or perilonal tissues. Patients in this category, presented to the health professional or untrained personnel with an already swollen Jaw. Their situation was worsened by unsuccessful tooth extraction. The second category, the postoperative cases, referred to cases where there was minimal or no swelling but had limitation of mouth opening. Patients in this group had their Jaws forced open and extraction attempted.

Table 1: Distribution according to job description

Job Description	No.	Percentage
Farmers	14	53.85
Traders	9	34.62
Apprentices	3	11.54
Armed forces	1	3.85

Table 2: Distribution according to causative factors

Causative factor	No.	Percentage
Odontogenic	9	34.62
Postoperative	17	65.38

Table 3: Distribution according to tissue spaces

Tissue space	No.	Percentage
Submandibular space	24	92.31
Submasseteric space	17	65.38
Parapharyngeal space	11	42.31
Infratemporal/Temporal	9	34.62
Cervical/Supraclavicular	9	34.62
Subimaginal	5	19.23
Submental	5	19.23
Buccal	2	7.69

DISCUSSION

The pain experienced in tooth ache has been described as sharp, throbbing, lightening in nature and so on. It is usually so severe that the victim looks for immediate relief to the excruciating pain. This emergency search for a health personnel, has not always led to a pleasant experience as our study has shown.

Majority of our patients were young adults aged less than 50 years and were predominantly males. This male preponderance may be due to the fact that males do not take care of their oral hygiene as much as their female counterparts. It is also common in our environment for the males to ignore routine dental check up and early visit to a dentist due to daily pursuit of family up-keep, as was seen in our patients. This position is supported by the fact that majority (60%) of the patients managed were involved in low income jobs where the amount of money earned in a day is dependent on the length of time put in at wok.

Like in most developing countries, health care facilities in Nigeria, are grossly inadequate. This is in terms of personnel and equipment. Some government owned dental clinics are manned by dental therapists and dental surgery assistants and in some cases by fresh dental graduands. These personnel occasionally out of overzealousness, throw the ethics into the winds and carry out procedures they are not trained or experienced in. The lack of enforcement of regulatory laws by the relevant government agencies to checkmate such wrong practices, resulted in the mismanagement of the patients seen in this study. In a study of 266 cases of cervicofacial infections of dental origin in the United Kingdom, lack of access to the National Health Services (NHS) primary lave dental services following changes in service provision and remuneration of dentists especially in areas of high treatment needs was given as the reason for the occurrence (Deji *et al.*,1989) [4].

As clearly stated by Childs and Courville,(1942), if the tooth is the element resulting in the inflammatory process, its extraction is indicated, but if the spread has involved the surrounding tissues, the tooth should no longer be regarded as the only important factor in the disease. In many situations, depending on the site and patient's defense and immune mechanisms, the surgical trauma of removal of the tooth may spread the disease (John *et al.*,1989). This principle as contravened as extraction was attempted in 17 patients with facial swelling associated with trismus.

The cornerstone of treatment is high dose antibiotics to manage the aerobic and anaerobic organisms, and prevent their spread to the tissue spaces and the meminges (Thomas *et al.*,1989) . All our patients were receiving antibiotics at time of presentation. However, we discovered that suboptimal doses, inadequate coverage/combination, and adulterated drugs were responsible for fulminating infections in 11 (eleven of our patients.

Our patient came in with different degrees of trismus and so it was difficult in most cases to do any meaningful intra-oral examination. Intra-oral periepical xrays were possible in a few cases with the aid of straight mosquito artery forceps. Right and left oblique lateral views were useful in 7 cases resulting from fractured mandibular wisdom teeth. The offending teeth in our study were - mandibular third molar - 18 lower first molar - 4, upper third molar - 3 and upper first molar -1.

Malnutrition and undernutrition are very common in our environment (Cousin, 2002). Apart from one young military woman, who tested positive to purified protein derivative and had glucose (2+) in her urine, all the other patients had no underlying medical condition following our routine examination and investigations. We therefore believe that malnutrition and undernutrition were contributory to the progressive ascending and multiple tissue space involvement in the patients. This agrees with earlier study by Adekeye and Adekeye(1982), where they stated that both bacterial and vival infections often follow a fulminating course in patients who have kwashiorkor. None of the patients managed had less than 4 (four) tissue spaces involved by the fulminating infections. The majority of the situations arose from lower molar teeth, only 5 cases of Ludwigs Angina were seen while ascending infection involving the submasseteric, infra-temporal and temporal spaces made up the rest.

Decompression was immediately done under topical anaesthesia (Bhatawadekar, and Bhardwaj,2002) , with through and through incisions made in the submandibular spaces bilaterally and the submental space anteriorly. Corrugated rubber drains were inserted and anchored to the skin. Tracheostomy was not considered necessary in any of the patients, though adequate preparation was made in case the need to reverse the decision arose. Altered blood (<5m/s) came out as there has not been any supparation.

Aside the cases that required immediate decompression, the rest of the cases followed our usual protocol of management of infection of orofacial spaces. The patients were admitted into the ward and massive doses of parenteral antibiotics given to localise the infection. Emilia *et al.*,(2004) advocated administration of high doses with good penetration into the soft tissues and bone, based on antibiotics with wide spectrum like cephalosporin of the second and third generation (Mandol, Rocephin), associated with a second antibiotics of the aminoglycoside group (Gentamicin, Neomycin) and

metronidazole to also cover the anaerobic bacteria, present in the deep unventilated cervicofacial deep tissues. Adekeye and Adekye(1982), in their study recommended use of Dalacin C and Gentamycin. Our patients were placed on Crystallin Penicillin 4 megaunits intravenously six hourly; Gentamicin 80mg eight hourly and intravenous metromidazole 500mg and eight hourly and continued till remarkable improvement takes place or microscopy culture and sensitivity test result is available. The antibiotics was changed after 48-72 hours to Rocephin in three and Linzcin in eight others as there was no remarkable improvement in the patients' conditions.

Incision and drainage was the most effective method of treatment for the abscesses. Though the infections and spaces involved were extensive, the incision and drainage was done under topical anaesthesia. Rubber drains were placed in and through all the tissue spaces involved and left in-situ as long as purulent material still drained out. Adekeye and Adekeye(1982), in their study noted that purulent exudates stopped within 2 - 3 days in their patients however drainage in our cases ranged from 5 - 9 days. In one 68 years old man, with involvement of the cervical and supraclavicular tissues, the drain was removed as the purulent material dissected through the tissues and collected at a lower level. New incision was made at the most dependent point and new drain inserted.

Microscopy and culture of sample specimen that are properly taken from orofacial abscesses and properly transported to the laboratory yielded mixture of aerobic and anaerobic organisms (Brook and Hirokawa, 1980; Adekeye and Adekeye 1982, Peterson *et al*., 2003, 2008, Emilia *et al*., 2004). Due to unavailability/cost of anaerobic culture in and around our hospital, only aerobic cultures were done. Staphylococlus aureus, streptococcus pneamoniae and pseudomonas were the major isolates from the specimens. The sensitivity results were in most cases not contributory as the laboratory lacked the discs of the new potent antibiotics which by practice, have been found to be very effective second line drugs.

Duration of hospital stay ranged from two weeks to five weeks. During this period, 8 patients benefited from special diet prepared by our nutrition department due to their state of malnourishment. Due to severe trismus in the patients all were on fluid diet comprising of pap made from millet, corn, soya beans, mashed beans, cray fish, eggs, palm oil and other pasty or beverage they could afford. Mouth opening remained inadequate after infection had subsided and was improved using flat wooden spatulas piled successively in the molar region or by use of acrylis screw placed in same region. When reasonable mouth opening (about 2cm) was achieved, chewing of non-cariogernic bubble gum was advised.

Menigitis, as a complication was seen in one of the patients. Neck stiffness and positive Kernig's sign were noticed and the Neurologist was invited. The patient was placed on Rocephin and lumber puncture aspirate taken yielded no growth after 48 - 72 hours. Ogundiya *et al*., (1989), stated that carvenous sinus thrombosis occurring secondary to dental infections is uncommon. Accordingly, no case was encountered in our study.

We recorded one death in a pregnant woman. She was admitted with a fulminating infection involving the submandibular space ascending up to the temporal fossa. She was at the time 5 months pregnant and appeared malnourished.

The obstetrics and Gynaecology team was invited and with the combined team, she was managed in our ward. She had spontaneous abortion of the baby on the 5th day of admission and died 48 hours later.

CONCLUSION

Lack of proper evaluation of the patients' general condition, advancing multiple space infection associated with trismus and lack of experienced personnel and facilities, contributed to the morbidity and mortality recorded in this study.

Addressing these issues in our healthcare facilities will help check the ugly trend.

Pix available: Cervicofacial Infection

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