

# Lesotho Medical Association Journal

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V O L U M E 8



N U M B E R 1

# Lesotho Medical Association Journal

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## From the President's Pen

*The budding on the trees, the flowers of the shrubs and springing herbs that beautifully clothed our country sides in majestic splendour to usher in Spring after the gloomy and cold days of Winter a few months back, have turned into thick foliage and green fruits characteristic of early summer. You may call it green summer. In our region this coincides with the end of the year and the birth of our Lord and Saviour Jesus Christ in whose name I send you Greetings. Green summer, as nature has it, will soon turn into yellow summer, showing signs of aging and readiness to succumb to gravitational forces. What a joy with summer around. There is plenty to eat and plenty to drink. With the warmth and festivities that come with it, one will wish summer never goes away, but it has its own nuisances. It has to be so in accordance with the laws of nature. There is nothing one can do but take it as a challenge of the season that one has to live with. The cycle of events repeats as the seasons come and go, each representing unique expectations and challenges, balanced in a way, sometimes unfavourably enough, to make us wish that the next season were here with us.*

*Like the seasons, so are the patterns of our lives. Nothing is stable and defined in the true sense; a normal life is one that has ups and downs. What we may consider a perfect life, with all the joy and glamour that go with it as we may wish to lead, in my thoughts, is rather "utopic". It does not exist. The ups and downs of our lives will always be there. That was how the Creator intended to perfect his creations. The downs are periods of reflections in our lives, periods of redefining who we actually are and periods of vital decision-making. Very necessary periods of our lives, indeed. The ups, my thoughts again, tell me are simply periods of presenting opportunities, periods when we are more capable than ever to offer our benevolent and selfless service to and for the benefit of humanity that is fundamental to the sustenance and continuity of mankind.*

*Quoting Albert Einstein (1879-1955), Prof G.A. Ogunbanjo, who was once a member of the Lesotho Medical Association and is currently the Editor-in-chief of the African Journal of Primary Health Care and Family Planning, cannot stress the importance of our subservience to our fellow human beings more than he did when he said, "Only a life lived for others is worth living." We*

*have a vocation that has at its pinnacle, service to mankind and a call to save lives. What better opportunity that this do we have, than to live a life "worth living." Let us continue to work hard with a unified front in which we share ideas, plan and dialogue together on the way forward to establishing an acceptable cost effective health delivery system that will ensure health for all as enshrined in the much publicised millennium development goals of the United Nations.*

*As a means of recognizing the enormous role certain individuals and organizations have been playing in their bids to see the Lesotho Medical Association achieve its goals, I take a special note at this point, of the substantial progress my administration made in sourcing funding for the activities of the association over the past few months.*

*On behalf of the association, I extend my heart-felt and sincere appreciation to those philanthropists who have been of immense and visible importance. However, their identities have been withheld for obvious reasons of anonymity. May they not ever lack, for freely they gave, freely they surely would receive.*

*On a very sad note, I wish at this point, to bring to memory and give condolence to one of our executive members - Dr. Omar S. Altaf who lost his wife during this year, May her soul rest in perfect peace!*

*On the Association front, LMA was able to attend the 2nd WONCA Africa Regional conference in Rustenburg in South Africa, held between 25th and 28th October 2009. Thanks once again to the generosity of the above indicated donors without the contributions of whom the Association would not have been able to take part in this conference.*

*The theme of the conference was about defining family medicine in the African context as compared to the practice of the discipline in the developed countries. The conference was organised in a workshop style where working groups were assigned various topics to discuss and provide ways forward. The participants at the conference deliberated on the following topic:*

- Defining the context and community within which family medicine is practiced in Africa;*
- Primary health care and health systems in Africa;*
- Training in family medicine;*

- Ensuring quality of family medicine practice in Africa;
- Defining the role of the family practitioner;
- Equity and family medicine;
- Private practice, faith based hospitals and public/private partnerships, and
- Women in family medicine.

*In attendance at the conference, were two-hundred and sixty participants from the medical fraternity who were drawn from all parts of the world. The eight topics stated above were developed and ratified by participants from WONCA AFRICA and World WONCA. The presidents of both WONCA World and WONCA Africa attended the conference and made very useful and beneficial contributions during the brain-storming sessions. The consensus reached will be published in the next edition of the Lesotho Medical Association Journal.*

*On behalf of the executives of the Lesotho Medical Association, I wish you all, a fulfilling coming year.*

*Molimo A Re Thuse, Khotso, Pula, nala!!!*

Dr. C.K. HOEDOAFIA  
President - LMA.  
1st Jan 2010

## Editors

Dr. M. Mokete  
Dr. Mohapi  
Dr. Tiam

## Instructions for Authors

The Lesotho Medical Association Journal accepts editorials, original research papers, review papers, case discussions, clinical guidelines, letters and Lesotho medical news reviews.

The author should submit both an electronic and hard copy of the manuscript to the address below:

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# Bridging the Gap

M MOKETE, MD

Education about the scourge of HIV and AIDS seems to be inadequate as new infections of HIV and its sequelae AIDS are still rampant in spite of the fact that the first HIV case in LESOTHO was reported.

Subsequent campaigns about knowledge, practices and attitudes seem to make a little dent on the HIV bushfire as shown by Lesotho's ranking of number three (3) in the Southern African country rankings. Workshops, radios, talks, media, support groups, "know your status" campaigns have had no significant reductions as we have remained at about the same level until now.

A sustained, intensive, educational campaign, about HIV and AIDS, graded and starting with the 500,000 kids in the Primary Schools, 100,000 in the Secondary schools, 10,000 in the tertiary level, and including the herdboys, would break the cycle of ignorance and infection early and at least assure a brighter future for Lesotho.

Bridging the gap with hitherto unemployed young nurses and retired nurses, by deploying them into all schools and sectors of education, will be pragmatic enough for the knowledge which is power

and attitude which is necessary for the way-forward of the youth of Lesotho venturing into the abyss of ignorance resulting in many, many young mothers bearing HIV infected babies.

The young nurses and retired nurses would preempt all the teenage problems and guide

the young girls and boys smoothly into adulthood, at a critical stage in life.

At least millennium Development Goals strategies: Number 3 of promoting gender equality and empowering women, as well as number 4 of non transmission of HIV from mother to child through knowledge attitudes and practices, including numbers 4,5 and 6 by reducing "child mortality" and improving "maternal health" and combating HIV/AIDS would be achievable.

# Management of Acne Vulgaris

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## INTRODUCTION

Acne vulgaris is a common dermatology condition that affects 80% of people between the ages of 11 and 30<sup>1</sup>. It is often a chronic disease characterised by a prolonged course and recurrences<sup>2</sup>. Its greatest impact is psychosocial and all clinicians who manage acne should appreciate the patient's perception of the severity and impact of the disease, and these perceptions should be considered when deciding on a management plan. It is thus important to individualize the management of acne for each patient while still following the basic management principles for the safest and best possible outcomes. This paper will outline these principles in caring for patients with acne.

## PATHOPHYSIOLOGY

The pilosebaceous unit is the target organ in acne, hence the distribution of the disease in areas with the greatest concentration of pilosebaceous glands. There are 4 primary pathophysiological mechanisms involved in acne. They are:

- Abnormal desquamation of follicular epithelium
- Excessive sebum production
- *Propionibacterium acnes* proliferation
- Inflammation and immune response<sup>3</sup>.

The microcomedo is the primary lesion of acne and it can evolve into either a non-inflammatory comedo or become inflamed and present as a papule, pustule, nodule or a cyst.

## MANAGEMENT PRINCIPLES

Treatment and maintenance therapy is directed at preventing the formation of the microcomedo and for the best results as many as possible of the primary pathophysiological mechanisms should to be targeted<sup>3</sup>.

### Topical therapy

Detailed and precise instructions to the patient are essential to avoid side effects, ensure compliance and obtain optimal results. It is prudent for the prescribing healthcare practitioner to familiarise themselves with the use of topical agents.

There is currently no topical therapy that effectively targets all the four patho-mechanisms of acne; therefore one has to select more than one agent for effective treatment. The choice of agent depends on mechanism of action of the agent (keratolytic, anti-inflammatory or antimicrobial), and whether the lesions are inflammatory or non-inflammatory<sup>4</sup>.

**Topical retinoids** - Microcomedones are the main target of topical retinoids<sup>5</sup>. Retinoids prevent formation of microcomedones and enhance penetration of other drugs. Newer retinoids, adapalene and tazarotene, also have anti-inflammatory activity. Tazarotene is the most effective topical retinoid but also the most irritating, while adapalene is the best tolerated. On the other hand, tretinoin is the most affordable. Overall topical retinoid preparations have simi-

lar efficacy, and the choice should be individualized based on affordability and side effects<sup>3</sup>. Topical retinoids are an essential component of combination therapy and preferred agents for maintenance therapy<sup>6</sup>. Examples of topical retinoids – tretinoin (retin-A<sup>®</sup>), adapelene (differin<sup>®</sup>), tazarotene (zorac<sup>®</sup> or tazorac<sup>®</sup>).

**Timing of application:** Retinoids are best applied at night to avoid photosensitivity but newer topical preparations like adapelene are not photosensitizing.

**Method of application:** Wash the face, avoiding excessive cleansing, with a gentle soap or face wash and apply the treatment 30 minutes to 1 hour later when the skin is dry, to minimise irritation. Gentle rubbing for 30-60 seconds and stretching of the skin during application improves percutaneous absorption. The treatment should be applied over the whole susceptible area, as the precursor lesion of acne, the microcomedo, is invisible. Avoid application to nasal folds, periorbital and perioral areas.

**Frequency of application:** The ultimate aim with retinoids is an overnight contact time every day. If there is persistent irritation treatment can be applied alternate days, while still aiming for daily application eventually. If the irritation is severe treatment can be suspended for 2-3 days and a mild topical steroid applied on the affected area until the symptoms subside.

**Quantity applied:** This should be enough to provide a thin layer over the treated area. As a rule of thumb, a drop the size of a pea is adequate to treat the face.

### Anti-resistance agents

Benzoyl peroxide (BPO) prevents emergence of resistance when used in conjunction with antibiotics. It suppresses *P. acnes* better than topical antibiotics. If prolonged courses of both topical and antibiotic types are used,

concomitant use of BPO is advised to reduce resistant organisms. BPO has an efficacy that can be maintained over years of use. It has good efficacy against superficial inflammatory lesions and is a good choice for patients with mild to moderate acne in combination with topical retinoids<sup>7</sup>. It is available in concentrations ranging from 1% to 10%. Its major side effects are irritation and dryness of skin. It also bleaches hair and clothes. **Examples** – Benzac<sup>®</sup>, panoxyl gel<sup>®</sup>

**Timing of application:** BPO is best applied once a day to avoid irritation.

**Method of application:** The treatment should be applied over the whole face after gently washing the face as described above. Higher concentrations and washes should be used for chest, shoulders and the back. In sensitive skin lower strengths should be used.

### Hormonal Therapy

Hormonal therapy is divided into two groups, agents that block androgen receptors (e.g. cyproterone acetate, spironolactone), and those that reduce production of androgens by adrenal glands and ovaries (e.g. oral contraceptives). Combined oral contraceptive is the most widely used form of hormonal therapy and treatment can be started on day 1 of the menstrual cycle if maintaining contraception is a priority or day 5 if the cycle is to be maintained.

Hormonal therapy is useful in androgen-driven acne, characterised by premenstrual flares, late onset, persistence or localization to the lower face. It is also a good choice for women with polycystic ovarian syndrome and those with acne who need oral contraception for other gynaecological reasons. It is best used early for patients with moderate or severe acne<sup>4</sup>. Hormonal therapy targets one

patho-mechanism of acne thus it is rarely used alone in the treatment of acne. In most cases it should be combined with other anti-acne therapies, including antibiotics and topical retinoids. Oral contraceptives are contraindicated in patients with a personal or family history of thromboembolism. Anti-androgens are best used in consultation with dermatologists, endocrinologists or gynaecologists.

Examples of oral contraceptives: Minerva<sup>®</sup>, Diane-35<sup>®</sup>, Yasmin<sup>®</sup>, Yaz<sup>®</sup>

### Topical antibiotics

Resistance is more likely to develop if they are used as monotherapy compared to oral antibiotics and they are also slower acting. They should always be used with benzoyl peroxide and a topical retinoid, never with an oral antibiotic<sup>2,3</sup>. Erythromycin and clindamycin are the most commonly used.

### Oral antibiotics

Oral antibiotics target *P. acnes* and inflammation. They should only be used in moderate to severe acne in the presence of inflammatory lesions. The current thinking is that they should be used only for 3 months as there is little improvement seen if used for longer, but an additional month can be considered if a steady improvement is seen and inflammatory lesions are still present. In cases where there are recurrences of inflammatory lesions they can be used intermittently. All oral antibiotics are best used as combination therapy with BPO and topical retinoids. This enhances their efficacy and limits development of resistance. If re-treatment is necessary, use the same antibiotic if it was effective, otherwise use an alternative antibiotic in a different class. It may be helpful to use BPO for a minimum of 5 to 7 days between antibiotic

courses to reduce resistant organisms on the skin.

*P. acnes* resistance is increasingly becoming a problem worldwide<sup>8</sup>. The major causes of antibiotic resistance in acne are: extending antibiotics for more than 12 weeks, multiple courses of antibiotics, topical use of antibiotics, living with acne patients treated with antibiotics, poor compliance and possible transfer from physicians<sup>2</sup>. There is cross-resistance within a class of antibiotics but there is no cross-resistance with other classes.

**Cyclines:** Oral cyclines are considered as first choice antibiotics when treating acne. Second generation cyclines have a better pharmacokinetic profile compared to first generation cyclines and lymecycline should be the first choice antibiotic when treating moderate to severe inflammatory acne. Doxycycline or minocycline can be prescribed as a second choice while first generation tetracycline is considered as the third choice. The recommended daily doses are 300 mg–600 mg for lymecycline; 100 mg–200 mg for minocycline and doxycycline; 1 g for tetracycline HCl and oxytetracycline. Consider increasing dose in patients with hyper-seborrhoea and the dose can be reduced after 2 to 4 weeks of treatment.

**Macrolides:** They are an acceptable alternative but the increasing *P. acnes* resistance to erythromycin and other macrolides limits their use in acne. They are useful in cases where cyclines are contraindicated. The recommended doses are: 500 mg twice a day for erythromycin and 75-150 mg a day for clindamycin.

**Co-trimoxazole:** It is indicated in cases of resistance to cyclines and macrolides. The recommended daily dose is 160/800mg.



The other classes of antibiotics should not be used to treat acne due to lack of efficacy and safety considerations.

### Combination retinoid-based therapy

There is good evidence that combination therapy that includes a topical retinoid enhances efficacy and reduces development of resistance to antimicrobials<sup>2</sup>. Topical retinoids and BPO could be used either on alternate days or one in the morning and the other at night. Fixed dose combination products with either BPO or antibiotics consistently showed better outcomes than those without retinoids and these might be convenient for the patient thus improving compliance.

Topical retinoids should be started at the patient's first visit, and should be a part of therapy for virtually all patients receiving antimicrobial agents. An effective strategy is to initiate topical retinoid therapy at the same time as oral or topical antibiotics and continue until reasonable clearing of inflammatory lesions occurs. Antibiotics can then be stopped, while continuing with topical retinoids to maintain remission of comedones and inflammatory lesions.

### Maintenance therapy

The microcomedone is the precursor of all acne lesions and the process of microcomedone formation is permanent and persists after acne is cleared. Avoiding microcomedone formation has a preventive effect in acne. After the acute phase of acne treatment maintenance therapy should always be considered to limit relapse<sup>2</sup>. Topical retinoids are the treatment of choice for maintenance therapy with topical azelaic acid (Skinoren<sup>®</sup>) being the second choice. The suggested duration of maintenance therapy is 6 to 12 months.

### Oral Isotretinoin

Isotretinoin as monotherapy is the standard of care for severe and nodulocystic acne. It is also indicated for inflammatory acne with scarring, moderate-to-severe acne unresponsive to conventional therapy, acne with severe psychological distress and frequently relapsing acne. It targets all the four pathophysiological factors and may achieve dramatic results even in severe disease. Side effects are common but manageable and patient counselling is critical. It is teratogenic and absolutely contraindicated in women of childbearing age without adequate contraception. The other notable side effects are dry mucosae, elevated triglycerides, hepatitis and photosensitivity. Monitoring of liver function and triglycerides is an important part of prescribing isotretinoin. These side effects are dose dependent and if severe the dose can be reduced.

The recommended dose is 0.5 – 1 mg/kg/day in two divided doses to a cumulative total 120 – 150mg/kg. This is usually spread over six to eight months.

There is a 20 - 40% rate of recurrence, usually 6 to 12 months after cessation of therapy and re-treatment may be needed. A topical retinoid should be used as maintenance therapy after completing a course of isotretinoin.

### SUMMARY

Acne is a multifactorial disorder and therapy should be directed to as many as possible of the pathophysiological factors. Topical retinoids are the primary treatment for most forms of acne vulgaris and should be used early for best results. They are also an essential part of maintenance therapy. Retinoids, like other topical therapies, should be applied to entire affected area.

Antimicrobial therapy should be added when inflammatory lesions are present. Antimicrobials should never be used as monotherapy, a retinoid or BPO should be added to minimize development of resistance. Oral contraceptives are indicated for androgen-driven acne and in moderate to severe acne where other therapies are contraindicated including isotretinoin. Isotretinoin is indicated for severe and psychologically distressing disease and can be used as monotherapy as it targets all 4 pathophysiological factors.

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# The Time from Initiation of a Stavudine (D4t)- Based Regimen to the Substitution of D4t with Zidovudine (AZT) due to Lipodystrophy or Peripheral Neuropathy in a Resource Constrained Setting

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\*At the time of this research, these authors were working at Senkatana Clinic in Maseru, Lesotho.

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## Introduction:

D4t is used in many resource-limited settings. It is first line in many countries for a couple of reasons. First, it is cheaper than AZT. Second, it is in a triple drug formulation that is not available with AZT in most resource-limited countries. However, it is responsible for more side effects than AZT.

Working at Senkatana HIV Clinic in Maseru, Lesotho the researchers noted many cases of side effects severe enough to warrant a substitution of d4t to AZT. We wanted to quantify the substitutions and see if a time frame could be determined from initiation to substitution.

## Materials and Methods:

Records of patients followed at Senkatana HIV clinic were reviewed. The records were reviewed for the initial ART regimen, any substitutions in medications and for the documented side effect warranting the substitution.

Also, the time period from initiation until substitution was determined.

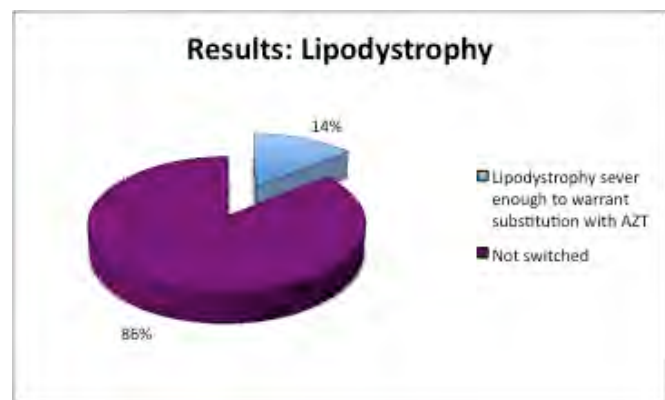
## Results:

110 patient charts were reviewed; 105 were started on a d4t containing regimen, either d4t

with Lamivudine (3TC) and Nevirapine (NVP) or d4t with 3TC and Efavirenz (EFV). The other 5 were started on an AZT regimen. The time frame from initiation until review was a mean of 33 months.

## Lipodystrophy:

Of the 105 patients on d4t, 15 (14%) were diagnosed with lipodystrophy severe enough to warrant substitution with AZT, while 95 patients (86%) were not switched. The time frame from initiation of a d4t regimen to change to AZT was a mean of 24.2 months and a range of 15 to 31 months.

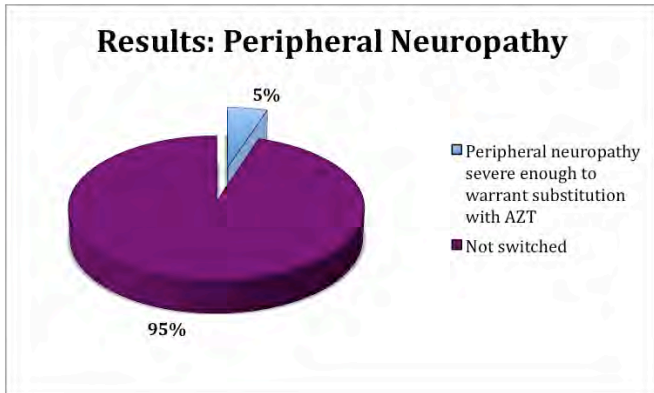




*26 year old African male on D4T-3TC-NVP for 23 months*

**Peripheral Neuropathy**

Of the 105 patients on d4T, 5 (5%) were diagnosed with peripheral neuropathy severe enough to warrant substitution with AZT, while 95% continued on the same regimen.



*37 year old African lady on D4T-3TC-NVP for 30 months*

**Discussion:**

Lipodystrophy and peripheral neuropathy are well known to be associated with HIV. They occur either as a result of complications of disease or as a complication of treatment.



*35 year old African lady on D4T-3TC-NVP for 20 months*

The aetiology of the body fat redistribution and metabolic abnormalities seen in antiretroviral treated HIV-infected patients remain largely unknown [1-5]. The NRTI stavudine has been associated with a higher relative risk for the development of lipodystrophy (primarily fat loss) than other NRTIs when used in combination with protease inhibitors [2,4].

Most diagnostic procedures available in the western world are inexistent in resource limited settings. Diagnosis is usually made late.

Lipodystrophy occurs as a part of mitochondrial toxicity syndrome. Prolonged treatment with D-drugs may also frequently lead to a predominantly symmetrical, sensory or distal polyneuropathy of the lower extremities [5].





*46 year old African lady on D4T-3TC-NVP for 18 months*

### **Conclusion:**

It was found that 20 patients (19%) followed at a resource limited setting developed clinically diagnosable conditions that required substitution of AZT for d4T.

Since the time until substitution was rather long (mean 24.2 months for lipodystrophy and 20.6 months for peripheral neuropathy), it is very important to follow the patients closely into the second year and afterwards.

Other side effects, including life threatening lactic acidosis were less easy to quantify. The laboratory tests needed to differentiate them from other serious illnesses were not available. Therefore, they might have been missed.

The dose of d4T was either 30 mg or 40mg depending on the patient's weight. All patients are now given the 30mg dose as recommended.

### **Acknowledgement**

Our most valuable patients

BMS-STF

Staff of Senkatana

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# Case Report from the Eyeward at Queen Elizabeth II Hospital, Maseru

‘M MOKETE, M.D., D.O., Consultant, V SHARMA M.B.B.S.; M.S, Consultant, and L ILESANMI, M.B.B.S. Registrar

An eighty five year old woman was admitted to the eye ward at Queen Elizabeth II Hospital, Maseru, Lesotho, with a complaint of a growth above the right eye on the medial side.

Examination revealed the following positive findings that she, indeed, had a growth, cylindrical above the right eye, unusual, hard to palpation, measuring 4.5 cm in length and 2.5 cm diameter at the base.

She had a vision of 3m frozen count in each eye with mature senile cataracts. She also had Parkinson's disease. She looked morose but otherwise physically healthy.

Further examination with x-rays and scan revealed a dermoid cyst. Diagnosis of

1. Dermoid cyst,
2. Mature cataract and
3. Parkinson's disease
4. Accompanied by senile dementia, (the latter after looking at her old records from the psychiatrist Department).

## TREATMENT:

This had to be done under General anaesthesia as she was not very cooperative as well as disturbing other patients in the ward who believed she was a witch because of the “horn” and her general mental condition.

## PREOPERATIVE PICTURES:



1. Bilateral cataract extraction was made with insertion of intraocular lenses.
2. Dermoid cyst was excised.

### PICTURES POST OPERATIVE



### RESULTS

Plastic excision of the dermoid cyst was successful cosmetically.

Cataract extraction with intraocular lenses was also successful because vision was 6/24 in each eye on discharge after a week.

### DISCUSSION

Blindness in itself for the elderly people can contribute to senile dementia because of the insecurity of the elderly people. Hence early treatment and increase of manpower and facilities can make a difference.

The additional problem of a long standing dermoid cyst with the unusual shape increased not only the problem just described but also increased problems socially in the patient's society where she was no longer acceptable. Excision did make grandchildren, the ward-mates and, above all, the patient happy with more acceptable behaviour.

In addition, the societal impact of blindness, on the economy (production, dependence, support) and self esteem is enormous.

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# Headache in Imaging Perspective

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## **Introduction:**

Headache is not a disease but just a warning saying that something is going wrong. The brain itself is not sensitive to pain. The pain sensitive structures are:

- The scalp, muscles, veins and arteries of the skull
- The under surface of the dura
- The arteries at the base of the brain
- The venous sinuses
- The cranial nerves
- The nerves supplying pain-sensitive fibers to the eyes, neck, mouth, sinuses and the skull.

A clear understanding of the mechanism of pain is essential to put headache in the correct perspective. Nerve fibers, which convey pain sensation to the brain, are covered with protective myelin sheath. Myelin is inexistent at the nerve endings; and hence called 'naked nerve endings.' When any agent stimulates these exposed free nerve endings, the adjacent tissue reacts by releasing various chemical substances. These substances are released in a positively charged electrical state. They encounter the negatively charged free nerve endings, and instantly create a pain impulse. The impulse is then transmitted electrochemically to the spinal cord. These in turn carry the impulse to the thalamus. The thalamus is the body's main pain center, where different pain signals are identified, filtered and sorted out. However, the thalamus appreciated pain only in its crude form. The pain impulse is finally transmitted to the post Rolandic sensory area of the cerebral cortex. It is as this sensory cortex the pain is really appreciated in its pure form.

There are five principal mechanisms of headache.

**Muscle contraction:** Tightening of posterior cervical muscles and scalp cause "Tension Headache". Contraction leads to pressure upon blood vessels and tissues, and causes release of chemical substances that trigger pain impulses. Nervous tension is one of the common causes of tension headache. Other causes are voluntary/involuntary tightening of muscles of facial expression and muscles of the neck.

**Traction:** Space occupying lesions (SOL) cause headache by mechanism. SOL causes pain-sensitive tissues to stretch. This produces fleeting pain.

**Inflammation:** Such headaches can be produced by a number of diseases due to infection of different structures in and around the head. The most common is infection of the sinuses. Temporal arteries and meningitis are other examples.

**Vasoconstriction and vasodilatation:** Migraine headache is the example. The arteries constrict before the headache begins, causing aura and spreading neuronal depression, and then dilate to initiate pain. Vasodilatation causes release of chemical substances that induce sterile neurogenic inflammation and stimulate trigeminovascular system. Cluster headache is another example.

**Direct Pressure:** Direct pressure causes classic headache brain tumor. The tumor may compress against a pain sensitive area. Skull is a



closed cavity with a little scope to accommodate. A tumor or abscess may increase the pressure within the skull. However, these are often associated with other neurological symptoms like convulsions, etc.

Headache is classified as **primary** and **secondary** type. Primary headache syndrome is tension headache, migraine, and cluster headache. Tension headache is episodic and chronic. Then the tension headache persists more than 15 days a month, it is termed as chronic daily headache. Primary headache syndrome is not associated with demonstrable organic disease or structural abnormality and most of the cases are benign. Laboratory and imaging findings are often normal and if any abnormality is detected it most often does not explain the cause of the disease.

Secondary headaches are usually of recent onset associated with abnormal clinical, laboratory and imaging findings. Recognizing the secondary headache is critical not only for management but also for identifying life threatening conditions (Red Flag Headache, described below). There is no relation between the severity of pain and the severity of possible serious illness. A violent headache can be unimportant or a minor headache can be a warning sign of serious problems. The type of pain (dull, sharp, throbbing, steady, intermittent) does not mean much either, as far as seriousness is concerned.

Though most of the people consider long standing or disabling headaches as very serious conditions, they are often wrong. Certain symptoms should alert the doctor for a thorough medical check-up.

The symptoms of **RED FLAG HEADACHE** are:

- Sudden severe headache which strike unexpectedly
- Headache accompanied by fever
- Headache associated with confusional syndrome
- Headache with localized pain in the eye, ear or specific area of the head
- Post-traumatic headache
- Recurring headache in children
- Headache that interferes with normal daily work
- Headache accompanied by convulsions
- Sudden changes in character/ pattern of chronic headache
- Headache aggravated by coughing, straining or stooping
- Headache that awakens at night.

### PRIMARY HEADACHE

#### **Tension headache**

Tension headache is the most common type of primary headache. It is more common in women than men. Pain is pancranial and dull. Tension headache may be associated with other sensations like tightness, or pressure as if a band surrounding the forehead or the feeling that the head is swollen and may burst. The onset of the pain is more gradual than the other common types of headache, like migraine. The headache once established may persist with only mild fluctuations for weeks or even years. It may progress to chronic daily headache, They infrequently begin in childhood or adolescence but are more likely to occur in middle age and to coincide with anxiety and depression in the struggling times of life. The sleep is often undisturbed, the headache is present when the patient awakens or develops soon afterward and the common pain relieving drugs have very little or no effect at all. In fact, this is the only type of headache that exhibits

the peculiarity of being present throughout the day, day after day for a long long period. The pain however is mild to moderate in severity. An estimated 10 percent of people with tension headache also suffer from migraines. The dual presence of migraine and tension headache can be confusing to a doctor listening to a patient's symptoms. Some symptoms may indicate migraine, some may not. It is important that patients describe their symptoms clearly and completely.

Nervous tension causes tightening of muscles of the back and the neck. Muscle contraction exerts pressure upon blood vessels and tissues, leading to release of chemical substances that trigger pain impulses. Other causes are voluntary/involuntary tensing of muscles of facial expressions, or neck muscles while working long hours, performing boring jobs, continuous irritative mental status or mood disturbance. Pressure of eye glasses, uncomfortable neck posture, and high heel shoes, can also cause headache by forcing into a posture that strains the muscles of the back.

### **Migraine**

The second most common cause of headache is migraine. The term 'migraine' goes thousands of years back to Hippocrates, who called the condition 'hemicranias', meaning 'half skull'. The headache usually affects one half of the head. It can affect people of any age. However, 90% of sufferers are women. Migraine also tends to run in families. Migraine attacks mostly the younger age group between 20 and 30s and fades away in the 40s. It is rare above the age of 50.

The "**classical**" migraine is uncommon and usually is preceded by aura. "Fortification Spectra" or "Scintillating Scotomas" are very pathognomonic. There may be blind spots in the visual field, and vision in one eye may be

lost completely for a while. Other symptoms of impending migraine headache may include numbness or tingling of a limb that gradually spreads through part or all of the body on the opposite side where the headache starts. The victim may feel depressed and helpless, with feelings of irritability. Following aura the headache is excruciating not responding to the usual pain killers. Headache is usually confined to one side, later may spread to the other side. The headache continues to increase sometimes to the point where the patient can no longer stand the agony. As pain increases, appetite vanishes and nausea and vomiting are likely to appear. Phonophobia and photophobia usually develops. The classic migraine lasts for four to six hours without treatment, with the pain gradually receding after reaching a peak within two hours.

The "**common**" migraine is more frequent than classical type but similar to the "classic" migraine except that it is not preceded by visual or sensory disturbances. This type of migraine found in a majority of sufferers begins without any aura and builds to a peak. Headache lasts from a few hours to more than a day and may be accompanied by nausea, vomiting, phonophobia and photophobia.

### **Cluster headache**

The symptoms of a typical cluster headache are characteristic. In contrast to the other forms of headache, cluster headache is seen predominantly in the adult males. The sudden onset of clusters of pain last from ten minutes to two hours and then fades away only to reappear later. Headache is episodic and may recur even after years of symptom free period. The pain is very excruciating and mostly retro-orbital. The headache may strike with little or no warning. The eye becomes red, and may follow with tear and lacrimation. Cluster headaches usually strike during a period of

relaxation, for example while sleeping or in the drowsy half awake state in the morning.

The cause of cluster headaches is not yet known. Alcohol and red wine are powerful triggers for the pain, as are sometimes nuts, cheese and seafood, which causes vasodilatation. The headache may be equally triggered by smoking or even change in sleeping patterns.

## **SECONDARY HEADACHE**

**Aneurysm and AVMs** do not cause recurring headache unless compressing on adjacent cranial nerve or they rupture. Thunderclap headache is a sudden intense headache and described as “the worst headache of his/her life” by the patient. It is often associated with photophobia and neck rigidity. Headache may proceed confusion and loss of consciousness. The causes may be rupture of aneurysm, benign perimesencephalic hematoma.

**Intracranial Hematomas:** Hemorrhagic stroke can cause severe headache, This can also be secondary to red infarction, venous infarction, rupture of mycotic aneurysm or coagulopathy.

**CNS infection:** Headache of relatively sudden onset with fever often points towards meningitis and meningoencephalitis. In immunocompromised patients, febrile headache often points toward toxoplasmosis and tuberculosis. CSF analysis and laboratory tests and neuro imaging will often fix the diagnosis. Cerebritis, encephalitis and brain abscess has appropriate clinical background, and may be secondary to loco regional pericranial infection. Brain abscess behave like space occupying lesion.

**Brain tumor:** Brain tumors are very uncommon but a much feared cause of headache. At

early stage, the pain may be only at waking and disappear after the patient is up and about. In later stage, the pain may be constant. Headache due to a brain tumor may be exertional. It is often aggravated by coughing, straining change in posture, or movement of the head. There may also be vomiting often not preceded by nausea, memory loss, confusion, personality changes, disturbance of vision or sense of smell, depending on site of origin, Headache with postural component needs to be evaluated to exclude posterior fossa lesion and colloid cyst of the third ventricle.

**Metastasis:** Recent onset of headache in patients with neurologic symptoms and neoplasia suggest secondary lesion.

**Traumatic headache:** Significant blow to the head and brain leads to intracranial hematoma and this hematoma can cause headache as they also behave as space occupying lesion.

### **Pseudo tumor cerebri**

#### **Hydrocephalus**

**Temporal arteritis or Horton’s disease** is a type of cluster headache. This affects older patients about 70 years of age. Pain is in the temple and is throbbing in nature, mostly unilateral. The pain persists throughout the day and is particularly severe at night. The temporal region is thickened and painful. This condition can lead to blindness if not handled properly. Blood examination shows a high ESR. Biopsy of temporal artery is the answer to the accurate diagnosis.

**Hypertension:** Contrary to the popular belief, hypertension is not usually related to headache except malignant hypertension or diastolic pressure above 120 mmHg.

### Pericranial Headache

- ◆ Sinusitis
- ◆ Cervical Spondylitis
- ◆ TMJ Dysfunction
- ◆ Odontogenic Headache

### Trigeminal Neuralgia

This is not strictly headache, as the pain is confined to the face. This is a disorder of middle age and later life and consists of paroxysms of intense, stabbing pain. The pain is along the distribution of the trigeminal nerve. The pain seldom lasts more than a few seconds but may be so intense that the patient involuntarily winces. Another characteristic feature of trigeminal neuralgia is the initiation of pain by stimulation of certain trigger points of the face, lips, or gums as in shaving or brushing the teeth, or by movement of these parts in chewing, talking or yawning. In addition to the paroxysmal pain, some patients complain of a more or less continuous discomfort and itching of the face. Sometimes it is due to compression of the trigeminal nerve by a tortuous blood vessel.

### Headache: Take Home Message

The patients need to be evaluated neurologically and the role of thorough history cannot be over emphasized. Even though most of the people consider long standing or disabling headache as very serious they are often wrong. If the headache has not started suddenly, does not have traction characteristics, does not belong to red flag group, or does not have positive neurologic findings, the patients can be treated symptomatically. These types of headaches are benign until proved otherwise. Recognizing the secondary headache is critical not only for management but also for identifying life threatening conditions. Imaging investigations are vital in those cases. What often worries the patient is whether this is due to a brain tumor, aneurismal bleeding, brain abscess, etc.

Such headaches often have a recent or acute onset with no previous history of chronic headache. These are known as “Red Flag Headaches”.

The symptoms of a Red Flag Headache include:

- Sudden severe headache which strike unexpectedly
- Headache accompanied by fever
- Headache associated with confusional syndrome
- Headache with localized pain in the eye, ear or specific area of the head
- Post-traumatic headache
- Recurring headache in children
- Headache that interferes with normal daily work
- Headache accompanied by convulsions
- Sudden changes in character/ pattern of chronic headache
- Headache aggravated by coughing, straining or stooping
- Headache that awakens at night.

### Indication of Neuro Imaging:

- Rapidly progressing worst headache
- Recent change of severity frequency and pattern of headache
- Headache with positive neurologic findings
- New onset of headache after 50 years
- Immunocompromised and cancer patients
- Headache with Red Flag
- When you DO NOT want to examine the patient!

Imaging investigations are expensive and before requesting the imaging the physician should have specific question in mind to be answered by radiologist whether to diagnose or rule out certain pathology. The attitude of *checkup* and *why not* and *fishing* must be abandoned as these investigations are expensive,



keeping it in mind that imaging definitely plays a decision making role in diagnosis, management and follow-up of most of the red flag headache. Like clinicians, the radiologists also need *key information*. Appropriate relevant history helps the radiologist to choose the protocols to get focused answers in the shortest possible time. Bottom line: Adequate history, history and history. Lack of clinical communication between the radiologist and clinician will lead to frustration and dissociation of professional coherence.

### Management:

#### 1. Non pharmacological approach

- a. Reassurance
- b. Counseling
- c. Psychotherapy
- d. Life style change
- e. Bio feedback

#### 2. Pharmacologic approach

- a. Analgesic – Aspirin, Brufen, Emipirim, Florinal
- b. Sedative – Diazepam
- c. Anti-depressant – Amitriptyline

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