
**GLOBAL PROGRAMME FOR THE ELIMINATION
OF LYMPHATIC FILARIASIS**

**“SURGICAL APPROACHES
TO THE UROGENITAL
MANIFESTATIONS OF
LYMPHATIC FILARIASIS”**



World Health Organization, Geneva,

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GLOBAL PROGRAMME FOR THE ELIMINATION OF LYMPHATIC FILARIASIS

15–16 April 2002

REPORT OF AN INFORMAL CONSULTATION ON

*“Surgical approaches to
the urogenital manifestations
of lymphatic filariasis”*



World Health Organization, Geneva, 2002

Introduction

Lymphatic filariasis is currently endemic in 80 countries, in the tropics and sub-tropics. The disease has been targeted for global elimination by 2020. Transmission control and disability alleviation are the two pillars of the elimination strategy under the Global Programme for Elimination of Lymphatic Filariasis (GPELF). Interruption of transmission is being achieved by mass annual administration of diethylcarbamazine (DEC) or ivermectin to entire communities at risk of infection. When community drug consumption rates are adequate, this is expected to result in reduction of transmission of lymphatic filariasis to low levels, and ultimately in elimination of filariasis, preventing new infections from occurring and protecting future generations from the disease. Recognizing the physical suffering, gross disfigurement and consequent socioeconomic impact due to lymphoedema (particularly limbs), and the fact that simple foot hygiene can result in prevention of repeated attacks of acute adenolymphangitis (ADL) and progression of lymphoedema, efforts are being taken to teach patients and their families skin care and simple measures of hygiene. It is realized that a disability alleviation strategy needs to be evolved for lymphatic filariasis patients who suffer from several urogenital manifestations, the burden of which is larger than that due to lymphoedema of limbs. In view of this, the WHO unit for Strategy Development and Monitoring for Eradication and Elimination (CEE) called for an informal consultation meeting of surgeons to address the issue of surgical management of urogenital manifestations of filariasis.

Objectives and expected outcomes

The broad objectives of the meeting were to define the surgical approaches to the urogenital manifestations of lymphatic filariasis and examine them from a public health perspective. The meeting also sought to:

- Review the clinical epidemiology and the burden of the urogenital manifestations of lymphatic filariasis.
- Examine the relative importance of these manifestations and prioritize them for surgical intervention, where appropriate.
- Develop a protocol and algorithm for the surgical management of hydrocele.
- Discuss all issues (such as resources necessary for surgical intervention; patient access to surgery; training needs; information, education and communication [IEC] issues) related to developing hydrocele surgery as a morbidity management/control strategy in the public health context in endemic countries under the GPELF.

Global programme update

Consequent to the World Health Assembly (WHA) resolution on lymphatic filariasis elimination, WHO initiated the GPELF in 2000. Of the 80 countries endemic for the disease, a PELF has been launched in 30. A global alliance was formed for the purpose, and currently this includes partners from the private sector, research institutions and academia. The global programme has received tremendous support from its partners and has expanded rapidly during the last two years. By the end of 2001, nearly 26 million people in over 22 countries had been administered the combination drugs in mass drug administration (MDA) campaigns. In most countries where MDA has been initiated, reported and assessed coverage of drug consumption have been in the range of 70% and 90% of target populations. Management of the programme has currently been decentralized to different regions (which do not correspond to the WHO regions) to facilitate better implementation of the programme. Mapping activities have been completed in many countries and are in progress in the remaining endemic countries.

Disability alleviation and prevention

To help endemic countries develop strategies to prevent and alleviate disabilities associated with lymphatic filariasis, the GPELF has taken steps to develop guidelines. Meetings were arranged with several organizations with experience in the management of disabilities and handicap associated with chronic diseases, including Handicap International; Liverpool Lymphatic Filariasis Support Centre; International Skin Care Nursing Group, School of Nursing and Midwifery, University of Southampton; Oxford Centre for Healthcare Research and Development, Oxford Brookes University. The national coordinators of the lymphatic filariasis (LF) elimination programmes in Burkina Faso and United Republic of Tanzania (comprising Zanzibar) were also invited to share their experiences. The key concepts were also discussed during the annual meeting of the West African College of Surgeons, a round table conference was held at Yaounde, Cameroon. This meeting brought together surgeons from west Africa and from France, and members of the Pan African Association of surgeons (which includes the west African, east African, and Sudanese associations of surgeons). The round table was organized by the Cameroon Ministry of Health, International Volunteers in Urology, GlaxoSmithKline (the donor of albendazole to GPELF) and WHO.

A working document was prepared to initiate discussion for defining the principles of the strategies. The document was presented to the Technical Advisory Group (TAG) at its third meeting.

Epidemiology and clinical features of lymphatic filariasis

Global and regional distribution of lymphatic filariasis

Current global estimates suggest that around 80 countries are endemic for lymphatic filariasis. Of the three parasites causing LF, *Wuchereria bancrofti* accounts for over 90% of the global burden. *Brugia malayi* is limited in distribution to Asia, and *Brugia timori* to a few islands in Indonesia. It has been estimated that 1.1 billion people living in areas endemic for this disease are exposed to the risk of infection, and that there are about 120 million cases with either disease or infection (microfilaria carriers). Almost half (49.2%) of the 120 million estimated cases are in the (WHO) South-East Asia Region (India alone accounts for about 40% of the global cases) and another 34.1% of cases are in the African region; the rest are in the western Pacific (16.1%), eastern Mediterranean (0.3%) and Americas (0.3%). The 120 million cases of LF include 83.63 million cases of microfilaria carriers, 16.02 million cases of lymphoedema, and 26.79 million cases of hydrocele; this clearly shows that the burden of genital manifestations in filariasis in terms of hydrocele is greater than that due to lymphoedema. Of the 120 million LF cases in the world, although Asia accounts for the majority of infection (because of the large populations living in endemic areas), the prevalence of *W. bancrofti* is higher in Africa (8.97%) than in Asia (2.25%). However, this is expected to be an underestimate as the proportion of endemic population who are amicrofilaraemic but have evidence of infection in terms of a positive antigen test (as many as an additional 18% of endemic populations) was not included, so the actual number of infected or diseased people could be much higher.

Gender distribution and relation to infection status

Age and gender analyses of LF disease have shown that lymphoedema is practically the major manifestation in females (contrary to some observations, global meta-analysis has shown that the overall prevalence of lymphoedema is similar in both females and males) and hydrocele the major manifestation in males, particularly in *W. bancrofti* endemic areas. A distinct increase in age prevalence is seen for hydrocele. In most Asian and African sites, the prevalence of hydrocele can be as high as 50% in the older age groups (above 45 years).

The association of infection with chronic disease status has clearly shown that the prevalence of microfilaraemia in hydrocele cases is similar to the overall prevalence of infection in the locality. There was no difference in occurrence of hydrocele in microfilaraemic and amicrofilaraemic endemic male populations.

*Filarial aetiology
of hydrocele in
endemic areas*

Some studies have addressed the question of whether all hydroceles seen in endemic areas are of filarial origin. A study in Pondicherry showed that, by taking multiple criteria (clinical, histopathological, parasite demonstration in fluid and tissue, presence of filarial specific antibody/antigen, etc.), 69% of hydroceles could be assigned to be of filarial origin. However, since hydrocele is a pathological condition persisting for a lifetime, and since specific evidence of filariasis infection may not persist that long, it is difficult to exclude filariasis as an aetiological factor in all cases in endemic areas. Since the prevalence of other hydroceles in non-endemic areas is considerably low, unless otherwise proven, all hydroceles in *W. bancrofti* endemic areas are to be considered as of filarial origin. This question, however, requires re-examination, in light of the improved diagnostic tests that are now available (the immunochromatographic card test [ICT] and OG4C3 enzyme linked immunoadsorbent assay [ELISA] for filarial specific antigens, and ultrasound examination for detection of adult parasites in the scrotum).

*Size of hydrocele and
relation to acute disease:
results of a TDR study*

In a multi-centric study conducted by the UNDP/World Bank/WHO Special Programme for Research and Training in Tropical Diseases (TDR) during 1992–1995, clinical epidemiology of LF was addressed using a uniform protocol (TDR, unpublished data) and definition of disease. The sites included three from India (Pondicherry, Madras [now Chennai], Vellore), two from Africa (Ghana, Tanzania) and one from the Philippines. These studies revealed that the overall prevalence of chronic disease ranged from 2.38% in Tanzania to 19.96% in Pondicherry. The prevalence of lymphoedema was lower than that of hydrocele in all study areas (lymphoedema was not recorded in Philippines). Hydrocele was graded into those less and those greater than tennis ball size and it was observed in the three Indian sites that the prevalence of small hydrocele was higher (two thirds of total prevalence) than large hydrocele. In Ghana, the prevalence of the two grades was more or less equal; however, in Tanzania and the Philippines, the prevalence of larger hydrocele was higher. The mean age of the patients with smaller hydrocele was lower compared to those with larger hydroceles, suggesting the progression of smaller to larger hydrocele in the course of time. The annual incidence of ADL per 1000 cases was generally higher in patients with lymphoedema compared to those with hydrocele. Overall in hydrocele cases, the ADL incidence in Ghana ranged from 73 to 565.6 attacks per 1000 cases per year. The significant point is that ADL attacks form a part of natural history of hydrocele cases, and are responsible for severe physical disability and resultant loss of work.

Socioeconomic burden due to filariasis with special reference to urogenital manifestations

The social and economic impacts of chronic filarial disease including hydrocele have now been well documented. Hydrocele is known to be a cause of physical disfigurement, social stigma, loss of self-esteem, lowered employment opportunity, interference in sexual activity, and family discord. Hydrocele is also a cause of economic loss due to the direct costs of disease treatment, loss of work due to episodic attacks of ADL, lowered productivity, lowered labour input, and lowered input into economic and household activities. The silent sexual burden imposed by hydrocele has been well documented in a study from Brazil while the economic impact has been studied in Ghana.

Other epidemiological uses of detection of hydrocele

Hydrocele is the predominant manifestation in bancroftian filariasis, and detection of scrotal swellings among a fixed number of males in study sites by trained health workers was found to be a valid rapid assessment procedure (RAP). The prevalence of scrotal swelling detected by trained health workers showed positive significant correlation with that detected by physicians. Therefore, data for scrotal swelling prevalence obtained by physical examination of males by health workers can also be used for rapid epidemiological mapping of filarial disease. Recently the number of hydrocelectomies conducted, as a proportion of all surgical operations carried out in some areas, has been used successfully as an indirect marker of prevalence of disease in these localities. This could be pursued as a method for rapid assessment and rapid mapping, and also for assessing the current burden on available surgical facilities in different parts of the world.

Urogenital manifestations of lymphatic filariasis

The genital manifestations can be of several types:

- Acute inflammatory disease, such as funiculitis and epididymo-orchitis (inflammation of the testis, epididymis or spermatic cord). This is by far the most frequent manifestation and accounts for significant loss of man-hours at work. The condition can be easily managed at the peripheral level using rest, analgesics, and antibiotics where appropriate. Surgical intervention is not called for in this condition.
- Hydrocele (collection of fluid in the tunica vaginalis) and its complications such as chylocele (collection of chyle), haematocele (collection of blood), and pyocele (collection of pus). The latter three conditions are characterized by the non-transilluminescence of the contents of the tunica vaginalis sac.

This test can be used at the peripheral level for differentiating uncomplicated hydroceles from complicated hydroceles. It is easy to perform, and does not require equipment other than a good torch and an opaque tube about 6 inches in length and 1 inch in width. Skill in transillumination can easily be taught to physicians at level II.

- Lymph varix (dilatation and tortuosity of the lymphatics of the spermatic cord).
- Lymph scrotum (dilatation of the lymphatics of the scrotal skin, which then rupture on the surface, oozing lymphatic fluid).
- Filarial scrotum, filarial penis, or elephantiasis of the female genitalia (due to lymphoedema involving the subcutaneous tissues).
- Chyluria or haematochyluria (due to rupture of the retroperitoneal lymphatics into the renal collecting system).

Hydrocele accounts for more than 90% of the morbidity due to the above genital manifestations of lymphatic filariasis excluding acute inflammatory response. From the public health perspective therefore, in view of its prevalence, it was decided to concentrate surgical intervention for morbidity management on hydrocele.

Surgery in lymphatic filariasis

African experience

The primary presentation on the African experience was made by Dr Fru F. Angwafo III for Cameroon. Other surgeons from Africa provided more local specific information.

In Cameroon, 7-10 million of the total population of 15.5 million are at risk of lymphatic filariasis. The epidemiology of filariasis is complicated in this country due to the presence of other filarial worms apart from *W. bancrofti*, namely *Onchocerca volvulus* and *Loa loa*. The clinical manifestations of filariasis include limb disease (lymphoedema, secondary skin infection, ulceration, deformation) and urinary manifestations (acute glomerulonephritis, haematuria, chyluria). The genital disease is common in males, and manifestations involving the scrotal and spermatic cord and overlying skin include: chronic bacterial infection (epididymo-orchitis), chronic lymphangitis, acute adenolymphangitis, lymphangiectasis with incompetent valves, resulting in reflux, weeping scrotum with oozing of lymph or chyle. The other manifestations include lymph varix and lymph scrotum, which involve the skin. Genital disease involving the tunica and within are hydrocele, lymphocele, chylocele, haemato-chylocele.

The urogenital disease results in psychosocial burden to individuals, including disfigurement and loss of self-esteem, loss of libido, erectile

dysfunction, infertility, weeping scrotum and difficult ambulation. In females, apart from the urinary disease (haematuria and chyluria), lymphoedema of vulva and clitoris is also known to occur.

Expertise is available for surgical therapy of genital manifestations of filariasis. The most common surgery for hydrocele is complete excision of the sac. This is done in the belief that the tunica involved has undergone gross pathological changes and would constantly ooze if simply everted, resulting in complications. This was the perception of the surgeons and no hard data were presented. For lymph scrotum and penis, reconstruction surgery is offered, which gives good results. The surgeons were of the opinion that post-operative infection was a rule rather than exception, therefore antibiotic therapy is considered even prior to surgery. Certain important considerations require focus in each case. These are: site of harvesting graft, use of tissue expanders, infection control, and prevention of keloid formation. If the PELF plan strongly advocates surgery for filariasis, and provides support either directly or through international NGOs, the Ministry of Health can take a policy decision, which could lead to organized training in advocacy and, finally, to surgical management of morbidity. Filariasis mapping is being undertaken and will help identify areas in which to locate morbidity management centres with surgical facilities. There is a great deal of enthusiasm among the surgeons and, given the right international and national support, surgeons can play an important role in the PELF.

In Uganda, nationwide surgical camps are held once every two years. All cases that require any sort of surgery are screened in these camps, and surgery is offered to those who are fit enough. Hydrocelectomy formed 6% of all surgery in the last three camps. Most hydrocele surgery is carried out on an outpatient basis, using local anaesthesia. A midline incision on the median raphe is preferred in bilateral cases and even in large unilateral cases. For small hydroceles the sac is everted and for large hydroceles with a thick sac excision of the sac is recommended. The most important factor which decides the future of the case in terms of complications and recurrence, is ensuring proper haemostasis (by using continuous interlocking suture in tunica) and closing in two layers the dartos and skin, both using continuous sutures. Recurrence is rare and general surgeons perform surgery for hydrocele.

The situation in Ghana is similar to Cameroon. The country has currently been mapped. Most surgeons carry out excision surgery for hydrocele, which are usually large. The surgeons believe it is better to remove as much of the pathological tunica as possible, as it could cause problems to the patient later on. There is commitment from the Ministry of Health in Ghana, with WHO and NGO support, and the country is preparing to include surgery for hydrocele as part of its morbidity management strategy under the PELF.

Indian experience

Dr Monokaran made the primary presentation on the Indian experience and Prof. Ananthakrishnan made additional points and remarks. In India, surgery is offered for various clinical manifestations of LF: lymphoedema (grades 3 and above), hydrocele and its complications (such as chylocele, haematocoele), lymph scrotum, lymphoedema of female genitalia, chyluria, etc.

For lymphoedema, lympho-nodo-venous (LNV) shunts (either side-to-side or end-to-side) are carried out commonly in specialized centres where the expertise and interest exist.

As most hydroceles encountered in India are relatively small with thin sacs, eversion of sac is practiced by most surgeons in the case of small hydroceles. This is usually done under local anaesthesia on an outpatient basis. However, it is a normal practice to excise the sac in cases of large hydrocele with thick sac.

The primary surgical intervention for genital lymphoedema has been bilateral LNV shunt (which reduces the swelling drastically), followed by reconstructive surgery using skin flaps. Skin grafting is avoided as far as possible as the results of flaps are usually better.

Even for cases of chyluria, (after a routine cystoscopy) bilateral nodo-venous shunts are done, and then the affected kidney is completely mobilized from its bed by dividing all tissues around the Gerota's fascia leaving intact only the renal vein, renal artery, and ureter. The kidney is then placed back on its bed and a nephropexy done to prevent torsion. This procedure results in breaking all the lymphatic connections that could be responsible for leakage of chyle into the kidney. Experience in this surgery is limited to few centres in India.

All patients are treated with a course of antibiotics and anti-inflammatory drugs for 5 to 7 days irrespective of the type of surgery. Drains are not used routinely.

Both Dr Monokaran and Prof. Ananthakrishnan volunteered to train interested surgeons from anywhere, free of charge, if proper national and international arrangements are made.

Consensus on the surgical management of hydrocele

Although one report from India suggested that DEC therapy could reduce the size of hydroceles, it has become clear from a recent double blind study in Tanzania, with rigorous outcome assessment design, that DEC has no effect on size of the hydrocele. Therefore, surgery is the choice for management of filarial hydrocele, since it provides a definite cure for the patient.

Classification of levels of health care facilities

For management of hydroceles, health care facilities are classified into three levels.

Level I is the community level, where patients with scrotal swellings are detected. The community health care worker or the patient himself detects the swelling. Once a scrotal swelling is identified, the patient is referred, or reported, to a level II facility.

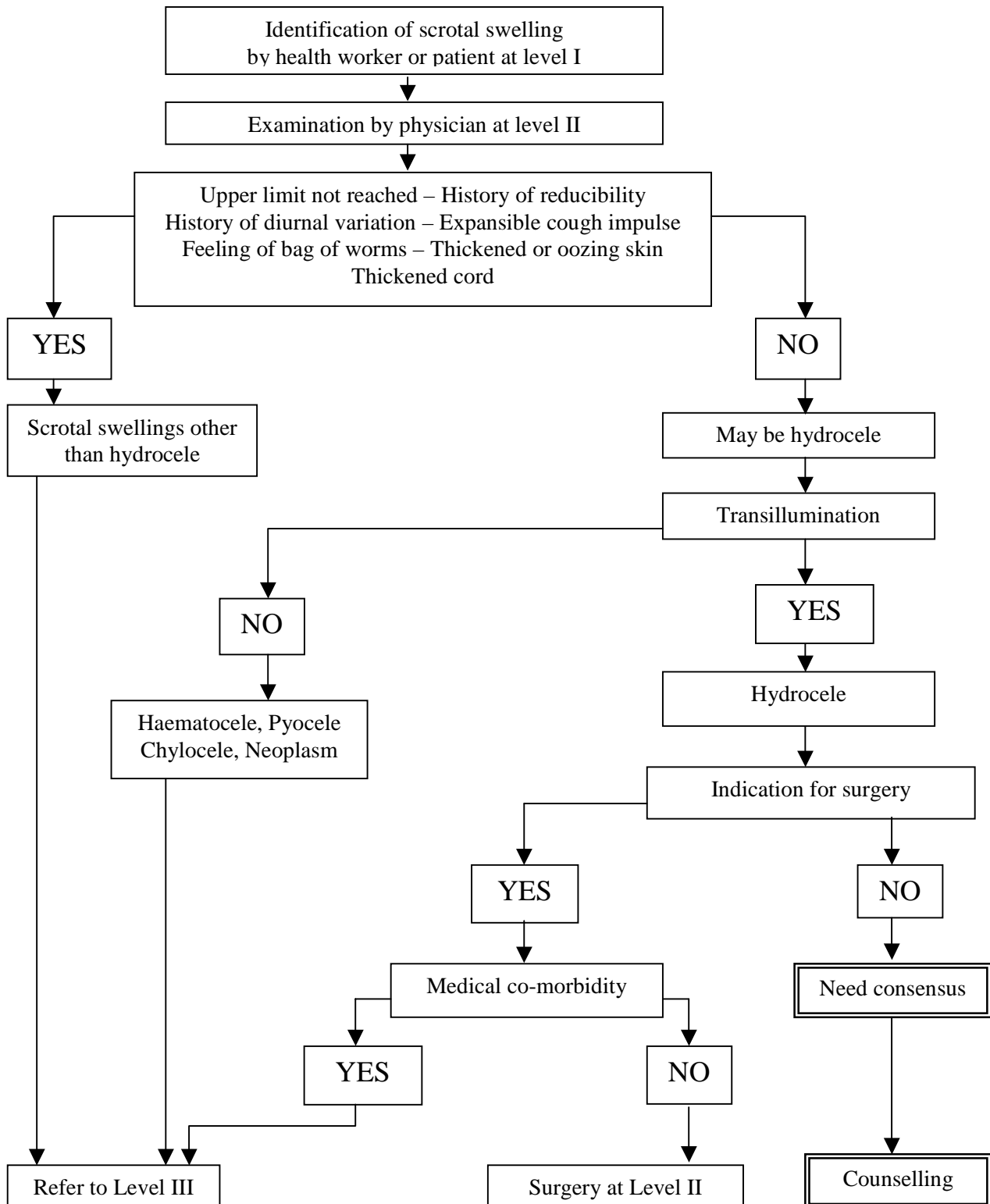
Level II is where surgery for uncomplicated hydroceles can be performed. Depending on the country, this could be a health centre or a rural/ community hospital. Level II health facilities should include a room in which minor surgical procedures can be performed under local anaesthesia. They need to be equipped to perform basic resuscitation, and to have facilities for observation of patients for 24-48 hours if required. A general physician, trained to perform surgery on patients with simple hydrocele, should be available.

Level III is equivalent to the district hospital level, and is where patients with more serious problems or complicated hydroceles can be referred for surgery.

Consensus on hydrocele surgery at level II

Diagnosis. Health personnel manning a level II facility should have the competence to examine a patient with scrotal swelling and differentiate between a scrotal swelling due to collection of fluid in the tunica vaginalis and an inguino-scrotal or scrotal swelling due to a cause other than hydrocele, as per the algorithm. Patients diagnosed to have swellings other than simple hydrocele should be referred to a level III facility. Once a scrotal swelling has been identified, the surgeon/physician should have the competence to perform a transillumination test on the scrotum. Patients with transilluminant scrotal swellings are classified as having a hydrocele, and are retained for further evaluation. Patients with non-transilluminant scrotal swelling should be referred to a level III facility. Also to be referred to a level III facility are children with hydrocele, patients who have hydroceles with associated co-morbid conditions (including known HIV positive patients), and patients in whom the diagnosis is uncertain.

Algorithm for management of scrotal swellings



Indications for hydrocele surgery

- Medical ineligibility due to untreated hydroceles.
- Interference with work.
- Interference with sexual function.
- Interference with micturition due to the penis getting buried in the scrotal sac.
- Negative impact on the patient's family.
- Dragging pain.
- Liability to trauma in view of nature of patient's work or mode of transport such as cycling.
- Possible effect on the testis of long-standing hydroceles.

Preoperative assessment procedures

- Evaluation for systemic illnesses such as history of diabetes mellitus, blood pressure, other systemic illnesses e.g. angina, drug allergies, sickling tendency, and other problems likely to increase the risk of surgery. Such patients should be referred to level III centres.
- Haemoglobin estimation by Sahli's method. Patients with haemoglobin level less than 10 g/dl should be referred to level III centres.
- Urine examination for sugar to rule out diabetes mellitus. Known or detected diabetics should be referred to level III centres.
- Measurement of blood pressure. Hypertensive patients should be referred to level III centres.
- A lignocaine sensitivity test.
- Informed consent.

Patient information pamphlet

A patient information pamphlet based on the following suggestions will help minimize the possibility of patient dissatisfaction after surgery. Informed consent should be obtained from the patient after informing him of the benefits, expected outcome, and possible side-effects of the procedure. The patient should know that:

- He has a condition which can be cured by a simple surgical procedure with minimal and minor side effects. However, he would need a period of 10-14 days' rest before he could resume work.
- He must inform the surgeon about his health status with respect to other illnesses such as diabetes, hypertension, bleeding disorders, sickling tendency, allergies, current medications, HIV positive status if known. If a patient has any of these, he should be referred for surgery to a level III facility.
- There is a likelihood of some swelling after the surgery. The swelling may last for a few weeks before the scrotum becomes normal in size.
- He must take the medication prescribed by the surgeon as per the schedule advised and for the duration recommended.

This schedule would consist of:

- an analgesic such as paracetamol or a non-steroidal drug other than aspirin to be started on the morning of surgery and continued for about 72 hours, and
- an antibiotic, such as amoxycillin and metronidazole, to be started orally the night before surgery and continued in the post-operative period for 5 days.
- He would be up and about 2-4 hours after surgery and not confined to bed.
- He would be awake during surgery. The operation would be performed by giving an injection into the scrotum to prevent pain. After surgery he would have a stitched wound in the scrotum, which would take about a week to heal. He would not need to return to the centre for removal of stitches since the sutures would automatically dissolve.
- In the event of undue swelling or oozing of blood, he may have to remain at the centre for a period of 24-48 hours. Otherwise he would be free to go home a few hours after surgery.
- He should report to the centre in case of:
 - fever
 - undue swelling
 - excessive pain
 - oozing of blood
 - foul smelling or pus discharge.
- He would have to return for a review to the centre 7-10 days after surgery, or earlier in the event of any of the complications mentioned above.

Anaesthesia

It is recommended that all operations for hydrocele at level II be performed under local anaesthesia using either bupivacaine or lignocaine. The procedure should consist of a spermatic cord block with the drug, combined with infiltration along the line of incision. In level II centres equipped with an anaesthetist and where surgery is already performed under regional or dissociative anaesthesia, these techniques can also be used, where necessary, on patients with hydrocele.

The operating room should have facilities for resuscitation and oxygen therapy. Anaesthetic practice should conform to the legal requirements of the country.

Surgical procedure

The procedure for hydrocele should preferably be an outpatient procedure. However, the centre should have facilities for observation of the patient for 24-48 hours after surgery should the situation warrant. The surgeon who performs the operations should have the competence to perform hydrocelectomy.

Incision

- A midline incision along the median raphe in cases of bilateral hydroceles and
- A vertical para-midline incision in case of unilateral hydroceles.

Procedure

It is recommended that the operation performed is a hydrocelectomy, i.e. a subtotal excision of the parietal layer of the tunica vaginalis leaving a rim of approximately one-centimetre width around the testis and epididymis. Aspiration with or without injection of sclerosant agents was not recommended due to the high recurrence rate and potential damage to the testis by the sclerosant agent. The procedure of eversion of the hydrocele sac (Jaboulay's procedure) also did not find favour because:

- In hydroceles which are larger than tennis balls, this procedure is likely to leave the patient with a significant swelling of the scrotum.
- In hydroceles smaller than tennis balls, both the eversion and the excision procedure are likely to run the same risk of complications.
- The tunica vaginalis is abnormal in patients with filarial hydrocele and is best excised. If left behind, some fear possible complications such as lymph scrotum or filarial scrotum. There is, however, insufficient published material on the occurrence of such complications, if any.
- If improperly performed, the procedure of eversion of the sac is associated with a greater risk of recurrence.

It was recommended that meticulous haemostasis be obtained from the cut edges of the tunica vaginalis using a running interlocking absorbable suture. Electro-cauterisation may be used where it is available for excising the sac. Drains should be avoided wherever possible. The wound should be closed in two layers.

- Interrupted or continuous absorbable sutures for the dartos, and
- Interrupted or continuous absorbable suture for the skin, to prevent the patient having to return for removal of sutures.

Use of chromic catgut sutures was recommended to minimize the cost.

Post-operative care

Antibiotics should be administered starting from the night before surgery, for a total duration of 5 days. This is to forestall the risk of infection since the patient would return to his home environment, which may be conducive to infection. The recommended antibiotic, in view of the cost and type of bacteria likely to be involved, is amoxycillin and metronidazole.

Analgesics should be administered starting from the morning of surgery and continued for 48-72 hours. The recommended choice of analgesic is oral acitaminophen or non-steroid anti-inflammatory drugs (NSAIDs) other than aspirin.

Patients may be allowed to return to their homes a few hours after surgery except under the following circumstances, in which case they should be observed for 24-48 hours:

- Placement of a drain, which has to be removed after 24-48 hours.
- Undue swelling, pain or oozing from the wound.
- The need to travel a long distance back to the home.

Patients should be asked to return to the centre 7-10 days later for a follow-up visit.

Assessment of needs

Recommended facilities for a level II centre

In addition to a room in which minor surgical procedures can be performed under local anaesthesia, it is recommended that the following be made available when resources permit:

- Facilities for post-operative observation of patients for up to 48 hours, if necessary.
- A laboratory in which the following tests can be performed:
 - haemoglobin level in blood
 - examination of urine for sugar
 - evaluation for sickling tendency in countries where this is necessary.
- Resuscitation equipment such as:
 - oxygen cylinders
 - ambu bag
 - oxygen mask
 - laryngoscope
 - endotracheal tubes
- Drugs such as:
 - corticosteroids
 - adrenaline
 - frusemide
 - sodium bicarbonate injection
 - diazepam injection.
- An autoclave, if possible, which can be used to recycle surgical instruments. In its absence, instruments that come in a packed tray can be repacked and sent back after use to the appropriate facility for sterilization.
- Pulse oximeter.
- Suction apparatus (not mandatory).
- A surgical diathermy machine (not mandatory).

*Kits for hydrocelectomy**Disposable and drugs*

• Syringe (10ml)	2
• Syringe (50ml)	2
• Needles, 20G	2
• Needles, 24G short	2
• Needles, 24G long	2
• Disposable drapes, small	2
• Disposable drapes, large	2
• Sterile gowns	2
• Surgeon's cap	2
• Surgeon's mask	2
• Non-permeable apron	2
• Trolley towel	2
• Surgeon's gloves	4 pairs
• Dressing materials	
• Gauze pieces	
• Surgical sutures 00 chr. catgut	6 ampoules
• Surgical impregnated hand wash brushes	2
• 2% lignocaine or bupivacaine without adrenaline	
• Povidone iodine solution for topical preparation	
• Tetanus toxoid	1 ampoule
• Antibiotics for 5 days	
• Analgesics for 2 days	

Instruments

• Sponge-holding forceps	2
• BP handle with blade	2
• Dissecting forceps, toothed	1
• Dissecting forceps, non-toothed	1
• Towel clips	4
• Metzenbaum scissors	1
• Mayo's scissors	2
• Trocar and cannula	1
• Curved artery forceps	8
• Straight artery forceps	2
• Allis forceps	2
• Needle holder	1
• Steel kidney tray	1

Access issues

The issue of patient access to surgery, particularly for hydrocele, was discussed. It was felt that the current level of access to hydrocele surgery in most countries was inadequate. The group suggested that hydrocele surgery services should be available at the most peripheral parts of the healthcare system, where they are easily accessible and affordable by endemic populations. Efforts should also be taken to ensure that these services become part of the regular health care system. There is also a need to expand the pool of doctors who can do this surgery, and to provide them with adequate resources (including training). The following are the most likely reasons for the poor access of patients to this form of treatment:

- Ignorance that they can be cured of their condition.
- Fear of surgery and its consequences.
- Lack of facility, or facility only available too far from the patient's home.
- Cost of surgery, hospitalization, transport, loss of wages during the surgery and post-operative stage.

These issues can be addressed through:

- Advocacy to improve outreach.
- Information, education and communication (IEC) for communities and patients.
- Strengthening of available facilities or creation of new facilities when possible.
- Training of existing health personnel, particularly at level II.
- Resource mobilization (community, local, national and international including NGOs).

To improve outreach, four different approaches (models) were proposed:

- Screening-cum-surgery camps: Level II or III surgeon moves to a site where cases of scrotal swelling have been identified by level I health workers. After diagnosis and pre-surgery assessments have been performed, the surgeon carries out surgery on fit cases. While the advantage of this approach is that the patients do not have to seek a healthcare facility, in real terms the concept of mobile teams with theatres is neither practical nor cost-effective. Further, the risk of complications (such as post-operative infection) is very high. Therefore, this option should be kept as a last resort (with adequate precautions to ensure safety), where other options are not feasible.
- Screening camps and surgery at level II: In this model, screening camps are held where health workers have identified scrotal swellings. Cases are examined and diagnosed by a level II surgeon at the camp site, and hydrocele cases found fit for surgery are referred to a level II facility for operation.

- In the third model, screening camps are held where health workers have identified scrotal swellings and cases are examined and diagnosed by a level II surgeon at the camp site. Hydrocele cases found fit for surgery are shifted, the day prior to operation, to temporary housing near the level II facility. The patients are taken to the level II facility only for the purposes of operation; they return to the temporary housing for post-operative observation.
- In the fourth model, several screening camps with health workers are organized at different places to identify cases of scrotal swelling. All cases are shifted to a well equipped level II facility where they are diagnosed and operated on by many surgeons working simultaneously in different operation theatres (in this way, all cases in a large area can be operated over a period of, say, 5 days, at the level II facility).

Although the choice of model will depend on various local factors, costs and logistics, participants at the meeting felt that *active screening and identification of cases, and the subsequent counselling of patients to accept surgery, should be withheld for some time as inappropriate or inadequate IEC and advocacy at the community level could produce counterproductive results*. A person hearing about possible cure and seeking surgery is more likely to accept the results of surgery than a person who is identified and persuaded to accept surgery - the level of expectation is much higher in the latter than in the former. Therefore, until surgical operation for hydrocele become more popular and generally acceptable to the community, only cases seeking diagnosis and treatment at level II should be considered for surgery.

From a public health point of view, the following steps need to be considered. This will help in proper planning and working out of logistics:

- advocacy, IEC,
- screening of scrotal swelling cases for simple uncomplicated hydrocele,
- diagnosis of cases of hydrocele,
- fitness testing for surgery,
- informed consent,
- preoperative preparation,
- anaesthesia,
- surgery (at level II),
- post-surgical observation,
- discharge,
- review.

Training and advocacy issues

Training. Trainers for training of level II surgeons are to be identified by governments/country coordinators. The profile for the trainers was finalized: qualified surgeons with experience in hydrocele surgery working in endemic areas (they could also be surgeons attached to teaching or training institutions with continued experience of hydrocele surgery). The identified trainers need to be trained in the following, through workshops (case demonstration and actual surgery need not be performed during the training):

- Surgery protocol for level II medical officers.
- Skills of level III surgeons (to be able manage scrotal swelling cases referred from level II).
- How to tackle complications which may develop in hydrocele cases operated on at level II.
- How to monitor and evaluate the performance of level II medical officers.

The trainers will then train the level II physicians/surgeons identified by national/local health systems. Level II medical officers need to be trained in diagnosis, testing for fitness for surgery, all aspects of protocol for surgery, post-operative care and follow-up.

IEC messages for communities and patients. Appropriate messages are to be developed in consultation with communication experts.

Research needs

- Operational feasibility of using the protocol developed above in different endemic and country (urban/rural) situations. It is envisaged that feasibility testing be initiated in selected areas. However, it is important to develop appropriate data capture formats (including for screening, operative, pre- and post-operative care, and other details such as patient perceptions and costs). Suitable monitoring and evaluation designs also need to be developed prior to conducting the feasibility trials.
- Development and validation of monitoring and evaluation methods.
- Comparison of results of eversion versus excision of sac in terms of post-operative complications, recurrence, and patient compliance and perceptions.
- Mapping of hydrocele case distribution and availability of level II facilities in different endemic situations and countries.
- Development of advocacy materials, methods and manuals for health workers and for surgeons at levels II and III.

Conclusions and recommendations

- Recognizing the magnitude of the problem of urogenital manifestations of lymphatic filariasis, that these manifestations are much more frequent than lymphoedema, and more amenable to curative therapy, the group recommended that surgical management of urogenital manifestations be given priority under the morbidity management arm of the PELF.
- Of all the urogenital manifestation of filariasis, hydrocele is the most common. The group took a public health perspective and focused on surgical management of hydrocele.
- Surgery for hydrocele should be available at the most peripheral parts of the health care system where it is easily accessible and affordable by endemic populations. Hydrocele surgery (and other disability measures) should become part of the regular health care system.
- The group defined three levels of health care management for surgery of hydrocele. The competence of personnel required and the activities at each level were discussed and finalized.
- For hydrocele surgery, a standard protocol was developed for:
 - diagnosis,
 - investigations,
 - preoperative assessment and care,
 - anaesthesia,
 - surgical procedure,
 - post-operative care,
 - follow-up.
- The group prepared a list of items to form a kit for surgery at level II, including physical facilities required.
- Training:
 - trainers for training of level II surgeons are to be identified by governments/country coordinators. The profile for the trainers was finalized. The trainers will train level II surgeons identified by national/ local health systems.
 - continuing medical education programmes, through workshops, round tables, symposia, seminars and exchange visits, should be set up for medical school teachers, residents and other surgeons, and private practitioners, on newer developments in the pathogenesis and management of filariasis, protocol for hydrocele management, and management of other urogenital manifestations of filariasis.
- The group prepared messages for IEC for communities and patients undergoing hydrocele surgery.

- The group discussed the problems related to patient access to hydrocele surgery and made recommendations to improve access.
- The group recommended that the protocol for hydrocele surgery be tested, reviewed and modified after 12 months of implementation in identified localities.
- The group emphasized the importance of prospective research to determine the optimal procedure for management of hydrocele at the field level.
- The group recognized the importance of developing guidelines for surgical management of urogenital manifestations other than hydrocele after review and appraisal of current options.

Annex I: Meeting Agenda

Informal Consultation on Surgical Approaches to the Urogenital Manifestations of Lymphatic Filariasis WHO, Geneva, 15-16 April 2002

Opening	09.00
Coffee	10.30 - 10.50
Lunch	12.30 – 14.00
Coffee	15.30 – 15.50
Adjourn	17.30

Monday, 15 April 2002

09.00

- | | | |
|----|---|--|
| 1. | Opening
Welcome and introduction
Objectives and expected outcomes
Meeting structure
Administrative matters | <i>Neira</i>
<i>Zagaria</i>
<i>Kumaraswami</i>
<i>Sharkey</i> |
| 2. | Global Programme update
Country activities, drug supply and quality assurance
Training
Programme monitoring
Operational research | <i>Biswas</i>
<i>Rio</i>
<i>Yactayo</i>
<i>Kumaraswami</i> |

10.00

- | | | |
|----|---|---|
| 3. | The Yaounde Round Table meeting | <i>De Vries/ Angwafo</i> |
| 4. | Epidemiology and clinical features of lymphatic filariasis | <i>Pani</i> |
| 5. | Urogenital manifestations of lymphatic filariasis | <i>Ananthakrishnan</i> |
| 6. | Surgery in lymphatic filariasis | <i>African experiences</i>
<i>Indian experiences</i> |

14.00 **Group work**

7. **Management of hydrocele**

Diagnostic issues

Review of current surgical approaches

Tuesday, 16 April 2002

08.30**8. Assessment of needs**

Manpower issues: What are our surgical resources?

- a. personnel (surgeons, general practitioners)
- b. basic surgical necessities, e.g. electricity, clean water
- c. additional surgical necessities: suture, antibiotics
- d. Minimum requirements

9. Access issues:

Do patients have access to surgical resources?

What are the limitations to access?

Inability to pay for suture?

Transportation? Cultural inhibition? Patient and community education?

Cost considerations

11.00**10. Priorities**

Where are surgical services most needed?

Where is education of surgeons and communities most needed?

Which are the countries or regions most ready for this service?

11. Training and advocacy

What is the most efficient method of disseminating the information?

International meetings? Surgical workshops? Small round table discussions? Academic centres? NGOs? Combinations? Campaigns by ministries of health?

12. Recommendations**15.30****13. Presentation of report (plenary)****17.30****Closure**

Annex II: List of Participants

Dr Ken E. Kwaku Aboah, Consultant Urologist, Lecturer, Department of Urology, Komfo Anokye Teaching Hospital, Kumasi, Ghana. Tel: 00 233 51 22307. E-mail: surgksi@ghana.com; surgksi@yahoo.com

Dr Ananthakrishnan Nilakantan, Director/Professor of Surgery, Jawaharlal Institute of Post Graduate Medical Education and Research (JIPMER), Dhanwantri Nagar, Pondicherry 605006, India Tel: 91 (413) 272 901; Fax: 91 (413) 272 066. E-mail: directjp@md5.vsnl.net.in (Co-rapporteur)

Professor Fru F. Angwafo III, Vice Dean, Faculty of Medicine and Biomedical Sciences, University of Yaounde, PO Box 1364, Yaounde, Cameroon. Tel: 237 770 5749; Fax: 237 231 1224; 237 231 2733; 237 220 2821. E-mail: fobuzshi@yahoo.com

Dr Sakti Das, C/o International Volunteers in Urology (IVU), 757 E. South Temple #110, Salt Lake City, UT 84102, USA. E-mail: SaktiDas@aol.com

Dr Catherine deVries, President, International Volunteers in Urology (IVU), 757 E. South Temple #110, Salt Lake City, UT 84102, USA. Tel: (Pager: 1810-914-6804), Fax: 1 801 5240176 E-mail: catherine@ivumed.org (Chairperson)

Dr Fred Kirya, Surgeon, Soroti Hospital, PO Box 289, Soroti, Uganda. Tel: cell phone 256 077 511660. E-mail: kiryafred@yahoo.co.uk

Dr Gurusamy Manokaran, Senior Consultant Plastic Surgeon, Apollo Hospital, Greames Lane, Chennai 600 006, India. Tel: 91 44 499 4493, 91 44 829 3333; Fax: 91 44 829 4429; 436 3646. Email: manokaran_g@yahoo.com or manditha@vsnl.com

Dr Sunny Doodu-Mante, Urologist-in-Charge, 37 Military Hospital, Box 282 Korle-Bu, Accra, Ghana. Tel: 233 21 024-265157.(mobile). E-mail: sunnydoodu@yahoo.com

Dr S.P. Pani, Deputy Director (Sr Gr), Vector Control Research Centre, Indian Council of Medical Research, Medical Complex, Indira Nagar, Pondicherry 605006, India. Tel: 91 413 272 396, 72397, 72784; Fax: 91 413 238132, 91 413 272041. E-mail: sp_pani@vsnl.com vcrc@vsnl.com; (Rapporteur)

WHO Secretariat

Dr Maria P Neira, Director, Department of Control, Prevention and Eradication (CPE), WHO, CH-1211 Geneva 27 (Tel: +41-22-791-3977, Fax: +41-22-791-4777, E-mail: neiram@who.int)

Dr Nevio Zagaria, Coordinator, Strategy Development and Monitoring for Eradication and Elimination (CPE/CEE), WHO, CH-1211 Geneva 27 (Tel: +41-22-791-2534, Fax: +41-22-791-4777, E-mail: zagarian@who.int)

Dr Gautam Biswas, Lymphatic Filariasis Elimination (CEE/FIL), Strategy Development and Monitoring for Eradication and Elimination, WHO, CH-1211 Geneva 27 (Tel: +41-22-791-3225, Fax: +41-22-791-4777, E-mail: biswasg@who.int)

Dr Vasanthapuram Kumaraswami, Lymphatic Filariasis Elimination (CPE/CEE/FIL), Department of Control, Prevention and Eradication, WHO, CH-1211 Geneva 27 (Tel: +41-22-791-3225, Fax: +41-22-791-4777, e-mail: kumaraswamiv@who.int)

Dr Francesco A Rio, Lymphatic Filariasis Elimination (CPE/CEE/FIL), Department of Control, Prevention and Eradication, WHO, CH-1211 Geneva 27 (Tel: +41-22-791-3833, Fax: +41-22-791-4777, E-mail: riof@who.int)

Dr Sergio Yactayo, Lymphatic Filariasis Elimination (CPE/CEE/FIL), Department of Control, Prevention and Eradication, WHO, CH-1211 Geneva 27 (Tel: +41-22-791-2767, Fax: +41-22-791-4777, e-mail: yactayos@who.int)

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