

Semua laporan kemajuan dan laporan akhir yang dikemukakan kepada Bahagian Penyelidikan dan Pembangunan perlu terlebih dahulu disampaikan untuk penelitian dan perakuan Jawatankuasa Penyelidikan di pusat pengajian

**BAHAGIAN PENYELIDIKAN & PEMBANGUNAN
CANSELORI
UNIVERSITI SAINS MALAYSIA**

Laporan Akhir Projek Penyelidikan Jangka Pendek

1) **Nama Penyelidik:** Dr.S.Chandrasekhara Reddy.....
Department of Ophthalmology
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**Nama Penyelidik-Penyelidik
Lain (Jika berkaitan) :** Dr.Ahmad Zakaria.....
Department of Nuclear Medicine
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2) **Pusat Pengajian/Pusat/Unit :** School of Medical Sciences.....
Universiti Sains Malaysia
.....Kubang Kerian; Kelantan.....

3) **Tajuk Projek:** Evaluation of nuclear dacryoscintigraphy in adult.....
patients with dacryocystitis.
.....
USM short term grant No.331-0500-3089
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4) (a) **Penemuan Projek/Abstrak**

(Perlu disediakan maklumat di antara 100 - 200 perkataan di dalam Bahasa Malaysia dan Bahasa Inggeris. Ini kemudiannya akan dimuatkan ke dalam Laporan Tahunan Bahagian Penyelidikan & Pembangunan sebagai satu cara untuk menyampaikan dapatan projek tuan/puan kepada pihak Universiti).

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Patency of lacrimal drainage apparatus was studied in 34 patients
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of chronic dacryocystitis (28 females and 6 males), aged between
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16 and 82 years (mean age 53.2 years) using nuclear dacryoscinti-
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graphy procedure. The watering of eyes was unilateral in 22 cases
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and bilateral in 12 cases. The postoperative status of the dacryo-
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cystorhinostomy procedure was assessed in one eye in 3 cases. The
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obstruction of nasolacrimal duct was noted in all the unilateral
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cases, however the obstruction of nasolacrimal duct in the unaffe-
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cted eye was detected in 3 of these patients. In bilateral cases,
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the obstruction of nasolacrimal duct was noted in both eyes in
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4 cases, and in one eye only in 8 cases. There was partial obstru-
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ction of nasolacrimal duct in the other eye in these 8 cases.
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In all 3 postoperative cases the surgery was found to be success-
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ful as the new opening into the nasal cavity was patent. The mean
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time taken for the tracer to reach the lacrimal sac was 7 seconds
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(range 5-20 seconds). The mean time taken for the tracer to reach
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the nasal cavity in 18 unaffected control eyes in cases of unilateral
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epiphora was 6 minutes and 20 seconds (range 1 minute 16 seconds -
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12 minutes). Thus this non invasive simple to do procedure was found
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to be very useful in assessment of the patency of lacrimal drainage
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apparatus in patients with chronic dacryocystitis preoperatively
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as well as postoperatively. The partial obstruction of nasolacrimal duct
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can be diagnosed easily by this procedure which can be missed by either
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syringing or by contrast dacryocystogram.

(b) **Senaraikan Kata Kunci yang digunakan di dalam abstrak:**

Bahasa Malaysia

Bahasa Inggeris

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.....	Nuclear dacryoscintigraphy
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.....	Chronic dacryocystitis
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.....	Nasolacrimal duct obstruction
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5) **Output Dan Faedah Projek**

- (a) **Penerbitan (termasuk laporan/kertas seminar)**
(Sila nyatakan jenis, tajuk, pengarang, tahun terbitan dan di mana telah diterbitkan/dibentangkan).

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This procedure can be used as one of the investigations in the
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Nuclear Medicine department in the patients' care in Hospital USM.
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"Microscintigraphy evaluation of the lacrimal drainage apparatus."
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Paper presented in 16th Singapore-Malaysia Ophthalmology Conference
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Johor Bharu, May 1998.
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- (b) **Faedah-Faedah Lain Seperti Perkembangan Produk, Prospek Komersialisasi Dan Pendaftaran Paten:**
(Jika ada dan jika perlu, sila gunakan kertas berasingan)

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(c) **Latihan Gunatenaga Manusia**

- i) **Pelajar Siswazah**
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- ii) **Pelajar Prasiswazah:**
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- iii) **Lain-Lain :**
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6. Peralatan Yang Telah Dibeli:

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UNTUK KEGUNAAN JAWATANKUASA PENYELIDIKAN UNIVERSITI

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T/TANGAN PENGERUSI
J/K PENYELIDIKAN
PUSAT PENGAJIAN

Evaluation of nuclear dacryoscintigraphy in adult patients with dacryocystitis
(USM short term research grant No. 331-0500-3089)

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Introduction

The tears are drained through lacrimal passages (puncta, canaliculi, lacrimal sac and nasolacrimal duct) into the inferior meatus in the nose. Patients with blockage in the tear flow complain of watering of eyes and they develop dacryocystitis (chronic or acute) secondary to nasolacrimal duct (NLD) obstruction. The assessment of NLD obstruction is done by either fluorescein dye test or by syringing the lacrimal passages. However, the results can be noted down in the medical record, but can not be documented for further follow up. The documentation of NLD obstruction can be done by contrast dacryocystography. The major disadvantages of syringing procedure and contrast dacryocystography are that they are invasive and may give false positive results by opening the minimal obstruction in the NLD as the saline or contrast dye is pushed with pressure while doing the procedure. A non-invasive, functional and morphological documentation of tear flow through lacrimal passages was first introduced by Rossomondo et al (1972) using radionuclide (Technitium-99m) imaging. Since the canaliculi are not instrumented and the radioactive material is suspended in a sterile normal saline solution, the natural physiologic dynamics of the drainage system are maintained. The radiation dose to the lens of the eye in this procedure is about 2% of that received in an anteroposterior radiograph. Neither short term nor long term complications following this procedure have been reported in the available literature. Hence the procedure appears to be quite safe. Only few reports are available in the literature about this investigation (Carlton et al, 1973; Choudhari et al, 1974; Chavis et al, 1978; Denffer et al, 1984; and Kadambi and William, 1990).

Objectives

Till date there is no published report on this subject from Malaysia. Hence, this study is undertaken for the first time in the country to

- (1) to identify the site of obstruction in ault patients suffering from dacryocystitis.
- (2) to establish the quantitative measurements of lacrimal drainage system in the unaffected eyes these patients.
- (3) to evaluate the results of dacryocystorhinostomy when ever surgery is done in these patients.

Patients and Methods

Thirty four patients of either sex, above the age of 15 years, attending the eye clinic of Hospital Universiti Sains malaysia, Kubang Kerian with complaints of watering of eye associated with mucopurulent or purulent discharge were included in this study. The symptomatic, unaffected eye of the patients undergoing this investigation was taken as control in this study. The patients with acute inflammatory diseases of the eye, trichiasis, entropion, ectropion, lagophthalmos which result in watering of the eye were not included in this study.

The patients were explained about the procedure and informed consent was taken. The procedure was done on an out patient basis. The patiebt was seated comfortably on a stool infront of the Toshiba gamma camera GCA 901 A/HG with low energy general purpose collimator, with forehead and nose touching the ganmma camera. One drop of 100 microcuries of Technetium -99m radioactive tracer (calculated on Autolab 100 dose calibrator) was instilled into the lower fornex of the affected eye and immediately into the lower fornix of the control eye and the patient was positioned on the gamma camera. Dyanamic scintigraphy, 4x magnification, was carried out. The imaging was done at 1 sec. x 16, 20 sec. x 16 and 1mt. x 16 frames. The pictured were stored in the computer and printed on x-ray plates later on for review. the patient was asked to blink normally throughout the procedure to facilitate the lacrimal pump action.

Interpretation of imaging

Normal pattern : Visualisation of the lacrimal sac and nasolacrimal duct and appearance of the radioactive tracer material in the nasal cavity.

Obstruction of nasolacrimal duct : Persistent pooling of the radioactive tracer material in the lacrimal sac with non visualisation of the nasolacrimal duct and absence of the tracer in the nasal cavity.

Results

Out of 34 patients of chronic dacryocystitis who underwent nuclear dacryoscintigraphy, 22 complained of watering in one eye (unilateral) and 12 in both eyes (bilateral). Twenty eight patients were women and 6 were men. The mean age of the patients was 53.2 years with a range between 16 and 82 years. The NLD obstruction was noted in the affected eye in all the 22 unilateral cases. However, NLD obstruction of the unaffected eye was detected in 3 of them in the nuclear dacryoscintigraphy procedure. In 12 bilateral cases, NLD obstruction was noted in both eyes in 4 cases, and in one eye only in the remaining 8 cases. There was partial patency of NLD of the other eye in these 8 patients i.e. the radioactive tracer material was noted in the nose in the late imaging pictures (after 15 minutes). Dacryocystorhinostomy was done in 3 patients in this study, and the pooling of the radioactive tracer material was seen in the nose in the early imaging pictures itself (within 4 minutes). There was no obstruction of canaliculi in any of the eyes studied in this procedure since the radioactive tracer material was seen in the lacrimal sac in the first frame of imaging itself. The mean time taken for the tracer to reach the lacrimal sac was 7 seconds (range 5 - 20 seconds). The time taken for the tracer material to reach the nose in 18 unaffected control eyes in cases of unilateral epiphora patients was 6 minutes 20 seconds (range 1 minute 16 seconds to 12 minutes).

Discussion

The advantages of nuclear dacryoscintigraphy procedure over contrast dacryocystogram are (1) it is non-invasive and simple to perform, (2) it can be done easily in any age group including children, (3) the assessment of tear drainage is more physiological,

(4) the exposure to radiation is minimal, (5) the dynamic studies are possible, (6) the comparison of follow ups is accurate and (7) the suspected abnormal side can be compared with the clinically normal side since both lacrimal passages can be imaged simultaneously during the procedure. The main disadvantage is that the gamma camera is essential to do this procedure, unlike skull x-ray table in the case of contrast dacryocystogram which is available in any hospital.

This procedure is more sensitive and physiological method of documenting the patency of lacrimal drainage apparatus. Following the instillation of one drop of Technitium 99m solution into the conjunctival sac, the material spreads over the globe of the eye by capillary action; thus labelling the tears and outlining the drainage pathways. The functional integrity of lacrimal drainage is assessed by visualizing the radioactive tracer material passing through the canaliculi, lacrimal sac, nasolacrimal duct and its entry into the nasal cavity through sequential images obtained by the gamma camera and computer.

Summary

Patency of lacrimal drainage apparatus was studied in 34 patients of chronic dacryocystitis (28 females and 6 males), aged between 16 and 82 years (mean age 53.2 years) using nuclear dacryoscintigraphy procedure. The watering of eyes was unilateral in 22 cases and bilateral in 12 cases. The postoperative status of the dacryocystorhinostomy procedure in one eye was assessed in 3 cases. The obstruction of nasolacrimal duct was noted in all the unilateral cases, however the obstruction of nasolacrimal duct in the unaffected eye was detected in 3 of these patients. In bilateral cases, the nasolacrimal duct obstruction was noted in both eyes in 4 cases, and in one eye only in 8 cases. There was partial obstruction of nasolacrimal duct in the other eye in these 8 cases. In all 3 postoperative cases the surgery was found to be successful as the new opening into the nasal cavity was patent. The mean time taken for the tracer material to reach the lacrimal sac was 7 seconds (range 5 - 20 seconds). The time taken for the tracer material to reach the nose in 18 unaffected control eyes in cases of unilateral epiphora patients was 6 minutes 20 seconds (range 1minute 16 seconds to 12 minutes). Thus this non invasive,

simple to do procedure was found to be very useful in the assessment of the patency of lacrimal drainage apparatus in patients with chronic dacryocystitis pre-operatively as well as post-operatively. The partial obstruction of nasolacrimal duct can be diagnosed easily by this procedure which can be missed by either syringing procedure or by contrast dacryocystogram.

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