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The Results of Lacrimal Duct Injury Treatment Between Microscope Method and Pigtail Probe Method

ผลการศึกษา การผ่าตัดเพื่อต่อท่อน้ำตา ภายใต้กล้องจุลทรรศน์ กับวิธีใช้โลหะแยงท่อน้ำตาแบบหางหมู

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ABSTRACT

A comparative study of the management of lacrimal duct injury by two techniques was presented. By evaluating the statistical data on 40 patients, 20 lacrimal duct injuries were repaired by microscope method under general anaesthesia in major operating room and the other 20 lacrimal duct injuries were repaired by pigtail method under local anaesthesia in a minor operating room. The study revealed that the good functional results were obtained in both techniques, but the operating time, cost and hospital stay were reduced in the pigtail probe method ; 10.0 : 45.9 minutes, 1,375.25 : 7,668.65 bahts and 0 : 1.75 days, respectively. The reduction of operating cost, operating time and hospital stay of the pigtail probe method were statistically signicant from the microscope method ($P < 0.001$)

บทคัดย่อ

การศึกษาเปรียบเทียบวิธีการผ่าตัดเพื่อต่อท่อน้ำตาโดยใช้กล้องจุลทรรศน์ กับวิธีใช้โลหะแยงท่อน้ำตาแบบหางหมู ในผู้ป่วยที่มีปัญหาท่อน้ำตาฉีกขาดจำนวน 40 ราย ในจำนวนนี้ใช้วิธีผ่าตัดภายใต้กล้องจุลทรรศน์ 20 ราย โดยการดมยาสลบในห้องผ่าตัดใหญ่ ส่วนอีก 20 ราย ใช้โลหะแยงท่อน้ำตาแบบหางหมู โดยการฉีดยาชาเฉพาะที่ในห้องผ่าตัดเล็ก จากการติดตามผลการรักษาพบว่าทั้ง 2 วิธีได้ผลดีใกล้เคียงกัน ส่วนเวลาในการผ่าตัด ความสิ้นเปลือง และจำนวนวันที่นอนในโรงพยาบาลนั้น พบว่าวิธีใช้โลหะแยงท่อน้ำตาแบบหางหมูสิ้นเปลืองน้อยกว่าอย่างชัดเจน และมีนัยสำคัญทางสถิติ ($P < 0.001$) กล่าวคือเวลาที่ใช้ผ่าตัด 10.0 : 45.9 นาที ค่ารักษา 1,375.25 : 7,668.65 บาท วันนอน 0 : 1.75 วัน ตามลำดับ

Introduction

Epiphora will occur if the lacrimal duct laceration is ignored or incorrectly treated. The aims of repairing a lacrimal duct laceration are to reestablish the patency of the damaged system with the least traumatic and the best esthetic results.

Numerous techniques have been used to aid in locating the ends of a severed lacrimal duct.[1-9,11] It is well known for reconstruction of a torn lacrimal canaliculus by passing a thread or a cannula through the distal and the proximal ends of the duct. The common problem was the identification and the approximation of the torn ends of a severed canaliculus when there was bruising and swelling of the lid. In 1962, Worst[12] described the use of a pigtail probe to aid in location the distal transected end of the canaliculus and fixation to reestablish it's continuity.

Since 1968, the pigtail probe was found to be valuable aid both in locating the distal end before fixation and reestablishing the continuity of the severed canaliculus by intralacrimal splinting. The operating time in searching for the distal transected end has been markedly reduced. In 1970, Wright[13] used microscope method and the patency rate approximately of 80% can be accomplished with endocanalicular support direct end to end suturing. In 1977, Sauder, et al,[10] advocated that pigtail probe method should be abandoned in repairing lacrimal duct laceration but this study had a surgeon factor involved that there were 20 surgeons in reconstructing the severed canaliculi in 51 patients. No single surgeon did more than 5 cases in almost 4 years in that study.

Materials and Methods

From July 1995 to September 2007, 40 patients were admitted to the Prachomklao Hospital for surgical treatment of 40 truaumatic canalicular lacerations. 20 lesions were endoticular stent direct end to end suturing by microscope, the other 20 lesions by pigtail probe method. All patients were randomized selected for surgical treatment.

All data of the comparative study of these two techniques were obtained from the patientsís charts and OPD cards. The following datas were recorded ; (1) Age (2) Sex (3) Cause of injury (4) Eye involved (5) Location of canalicular system damaged (6) Operation time (7) Hospital stay and (8) Operating cost.

Technique In Microscope Method :

The reconstruction was performed under general anaesthesia in a major operating room. An operating macroscope was used for magnifying the operative field. The distal stump of the torn lacrimal duct was identified. The distal and proximal lacerated canalicular stump were anastomosed using 4/0 monofilament suture stenting the lacrimal.

Technique In Pigtail Probe Method :

The patients were operated under local anaesthesia in a minor operating room and as outpatients basis. Only a pigtail probe with a suture eye and a suturing set was used for reconstruction. The probe was passed first through the dilated punctum of the uninvolved eyelid, then through the canaliculus, common canaliculus and out the cut medial end

of the involved eyelid (1) Next, a suture material (4/0 dermalon) was passed through the eye and the probe was backed out, leaving the uninvolved system intubated (2) The probe was then passed through the dilated punctum of the involved eyelid and out the cut lateral end (3) The lower end of the suture material was threaded through the eye and the probe was backed out to complete the intubation (4) The cut canular ends were sutured directly. The eyelid margins were closed in layer, using 6/0 nylon. Both ends of the suture material were knotted, top to the nonhairy skin and left in place for six weeks.

Results

1. Age : The age ranged from 6-62 years and the average was 31 years.
2. Sex : There were 28 males and 12 females and the sex ratio was M : F = 7 : 3
3. Cause of injury : The most common cause was vehicle accident, the others are being assaulted and dog bite.
4. Eye involved : The left more often than right. Inferior left = 47.5% (19), inferior right = 32.7% (13), superior left = 10% (4) and both superior right = 2.5% (1)
5. Location of canalicular system damaged : Lacrimal 95% (38/40) nasolacrimal 2.5% (1/40) and punctum 2.5% (1/40)
6. Operating time (minutes)

	n	X	SD	t	SIG.
Pigtial probe	20	10.00	2.45	10.156	.00
Microscope	20	45.90	15.62		

7. Hospital stay (days)

	n	X	SD	t	SIG.
Pigtial probe	20	0	0	8.596	.00
Microscope	20	1.75	1.75		

8. Operating cost (baht)

	n	X	SD	t	SIG.
Pigtial probe	20	1,375.25	230.37	22.309	.00
Microscope	20	7,668.65	1.240.37		

9. Results of treatment

Results	1 week	2 weeks	3 weeks
Good (no epiphora)	87.5 (35)	97.5 (39)	100 (40)
Fair (stress epiphora)	12.5 (5)	2.5 (1)	0 (0)
Poor (Frank epiphora)	0 (0)	0 (0)	0 (0)

Discussion

Choosing a technique for repair of a traumatic canalicular laceration in order to obtain no epiphora, which is a good sign after the repair, is a difficult problem. A comparative study between two techniques of repair of torn lacrimal canaliculi at Prachomklao Hospital was done. Comparing between using microscope and using pigtail probe was randomized done. The good functional results were obtained in both technique but the operating time, the operating cost and the hospital stay were decreased in the pigtail probe method. About anatomy position, the pigtail probe method had a good result of normal anatomy in all cases but microscope method sometimes has everts repaired lateral part lacerated lacrimal. The pigtail probe method was performed under local anaesthesia and the patients were discharged home immediately after the operation. This technique was done in a minor operating room. The microscope technique was performed under general anaesthesia and in a major operating room. The operating time, operating cost and hospital stay were significantly less in the pigtail probe method than the microscope method ($p < 0.001$). The results of this study are corresponding with those of Worst[12] and Johnson.[5] However, Sauder, Shannon and Flanagan[13] were debated because of 7.3% failure rate and their studies were done by 20 different surgeons in the 51 repairs, no single surgeon did more than 5 cases in almost 4 years in their studies.

For the developing countries, I would recommend that the canalicular laceration should be repaired by a pigtail probe method.

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