

## Results of Double Corneal Forceps Technique for Pterygium Excision at a Tertiary Care Hospital

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### Abstract:

**Objectives:** To study the efficacy and safety of a new technique for pterygium head excision using double corneal forceps.

**Methodology:** This descriptive longitudinal case series was conducted at Department of Ophthalmology, Mufti Mahmood Teaching Hospital, Dera Ismail Khan from 1<sup>st</sup> January to 30<sup>th</sup> June 2022 (6 months). After Informed consent and IRB approval, 25 patients with primary nasal pterygia were included. All patients underwent double corneal forceps removal of pterygium head irrespective of what procedure was followed to cover bare sclera. Ease of pterygium head removal, surgical time and complications were noted and were analyzed later.

**Results:** Out of 25, 18 (72%) were male and 7 (28%) were female with mean age of  $45.5 \pm 9.5$  years. The mean size of the pterygia was  $3.1 \pm 0.8$  mm. All patients underwent double corneal forceps technique of pterygium head removal quite easily. The mean duration of surgery was  $25.6 \pm 8.5$  minutes. 17 (72%) had no need for corneal scrapping with No. 15 blade. The mean follow-up period was  $2.7 \pm 1.6$  months. No patient had recurrence of pterygium.

**Conclusion:** Double corneal forceps technique is a novel, easy and very effective method for pterygium head removal. It reduces mean surgical time and overall need for corneal surface scrapping after head removal. *Al-Shifa Journal of Ophthalmology 2022; 18(3): 112-117. © Al-Shifa Trust Eye Hospital, Rawalpindi, Pakistan.*

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### Introduction:

A pterygium (derived from Latin word 'Pterygion', meaning a wing) is an ocular surface disease that involves triangular encroachment of elastotic degenerative subconjunctival fibrovascular tissue from the bulbar conjunctiva onto the surface of cornea in interpalpebral space.<sup>1</sup> Pterygium is usually found in hot sunny climates and is usually attributed to ultraviolet light exposure, although other etiological factors also exist.<sup>2</sup> It is found more commonly in males owing to their outdoor activities and is mostly present on nasal side due to sparseness of subconjunctival space on temporal side and due to temporal side being more unexposed because of early closure of eyelids temporally during normal blinking mechanism.<sup>3</sup> A kissing pterygium is the one which is present on both nasal as well as temporal side in the same eye.

Pterygium can be both unilateral and bilateral.

Pterygia are generally categorized into two types; a progressive and a regressive pterygium.<sup>4</sup> A progressive pterygium is the one which is thick and fleshy with vascular element of lesion advancing ahead of pterygium onto the surface of cornea while a regressive pterygium is the one which is thin and atrophic with little vascular element.<sup>5</sup>

A fully developed pterygium has 3 parts; a cap is a leading edge consisting mainly of fibroblastic infiltration that actively invades Bowman's layer; a head is present on corneal surface and lies behind cap; a body/tail is the part which is present under conjunctiva and can be easily dissected away from conjunctiva.<sup>6</sup> A Stocker's line is iron deposition on corneal epithelium ahead of cap and it usually indicates chronicity.<sup>7</sup>

Pterygia can be either primary, recurrent or pseudo-ptyerygium with a positive probe test.<sup>8</sup> A more widely used classification is according to degree of encroachment. In grade 1 pterygium, head is present at limbus but yet to encroach onto cornea, in grade 2 pterygium, head crosses cornea but not involving the undilated pupillary zone, in grade 3 pterygium, head involves the pupillary zone while in grade 4 pterygium, head crosses pupillary zone to go onto opposite side.<sup>9</sup>

Most common reason behind pterygium surgery is cosmetic intolerance. Visual disturbance occurs when there is corneal astigmatism due to fibrosis in the regressive stage or when there is grade 3 or 4 pterygium. Patients may also present with diplopia due to extraocular movements restriction because of rectus muscle involvement. Cystic changes and secondary infections are common complications.<sup>10</sup>

Different surgical techniques exist for surgical removal of pterygium. Most commonly done are pterygium excision with head transposition, surgical excision with bare sclera, excision with conjunctival autografts, rotational flaps, stem cell grafts, amniotic membrane grafts and excision

with use of antimetabolic agents like mitomycin-C (MMC).<sup>11</sup> There is a number of methods to remove the pterygium head from the surface of cornea. These include the simple avulsion of the pterygium head with the forceps, dissection with help of sutures, avulsion with squint hook and air assisted dissection.<sup>12</sup> In all techniques, there is usually remnant fibrovascular tissue on corneal surface which can be effectively removed by simple scrapping with a blade or crescent knife.<sup>13</sup>

We aim to describe a new technique of pterygium head removal from corneal surface using double corneal forceps which will possibly remove the need for scrapping of pterygium remnants.

### **Patients and Methods:**

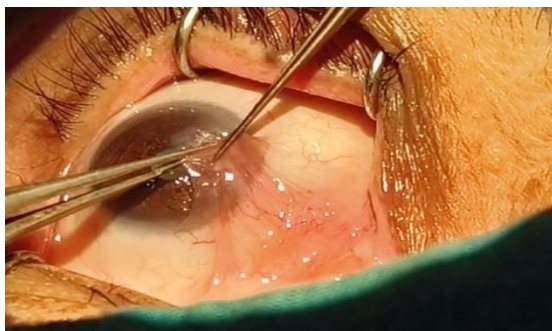
After obtaining informed consent and permission from Ethical Review Committee of hospital, 25 patients were included in this descriptive longitudinal case series. All patients were taken from outpatient department of Department of Ophthalmology, Mufti Mahmood Teaching Hospital, Dera Ismail Khan from 1st January to 30th June 2022 (6 months). All patients had primary and nasal Pterygia of at least grade II (size of more than 2.5 mm). Patients with recurrent, kissing or inflamed pterygium or with previous history of conjunctival surgery were excluded from study. All patients underwent surgery performed by same surgeon.

All surgeries were performed under topical anesthesia with Proparacaine Hydrochloride 0.5% drops (Alkan Eye Drops, Alcon laboratories, Inc.). Dropping was started 15 minutes before surgery with 3 times instillation 5minutes apart each. Once or twice drops was also instilled during surgery. Under aseptic measures, pterygium head was grabbed from upper and lower edge using double corneal forceps. (Figure 1) Then with use of forceps, head was elevated as to get idea of direction in which avulsing force has to be applied. (Figure 2) Pterygium head was detached by using combined forces of

double corneal forceps and head was then successfully removed. (Figure 3, 4) Corneal scrapping was done with help of No. 15 blade whenever necessary to remove pterygium remnants from corneal surface and end result was seen. (Figure 5) To cover the bare sclera, different techniques like head transposition, conjunctival autografts, amniotic membrane grafting and use of MMC were used afterwards.



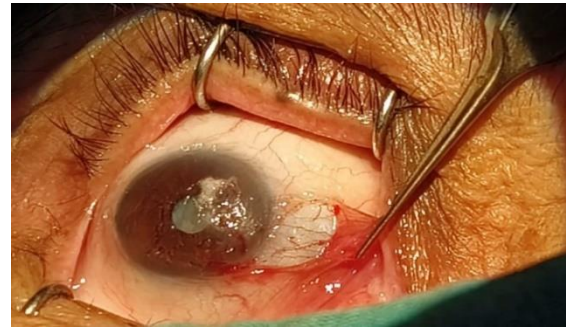
**Figure 1: Grabbing Upper and Lower Edge**



**Figure 2: Elevating the Pterygium Head**



**Figure 3: Detaching by Combined Forces**



**Figure 4: Pterygium Head Removed**

Postoperatively topical antibiotic, steroid and artificial tear drops were used. The patients were followed up on days 1, 7 and 30 and 3 months. All the postoperative examinations were carried out by the primary surgeon. The eyes were examined for residual pterygium tissue on cornea, recurrence and complications. All findings were saved on Excel Sheets and were analyzed later.

**Results:**

A total of 25 eyes of 25 patients were included in the study. Out of 25, 18 were male (72%) and 7 were female (28%). (Table 1) Mean age was  $45.5 \pm 9.5$  years. All of the cases were primary pterygia and all were on the nasal side. The mean size of the pterygia was  $3.1 \pm 0.8$  mm. All patients underwent double corneal forceps technique of pterygium head removal quite easily. The mean duration of surgery was  $25.6 \pm 8.5$  minutes. However, surgical time was dependent on surgical technique. (Table 2) Out of 25, 17 (72%) had no need for corneal scrapping with No. 15 blade. All surgeries were completed without any major complications. The mean follow-up period was  $2.7 \pm 1.6$  months. 5 out of 25 (20%) patients developed symptoms of dry eye otherwise no significant postoperative complications were noted. No patient had recurrence of pterygium.

Table 1: Gender and Laterality Distribution

	Gender Distribution		Laterality	
	Male	Female	Right Eye	Left Eye
<b>Number</b>	18	7	10	15
<b>Percentage</b>	72%	28%	40%	60%
<b>Total</b>	25 (100%)		25 (100%)	

Table 2: Mean Surgical Time

Surgical Step/Technique	Number of Patients	Mean Surgical Time
Removal of Head with Double Corneal Forceps	25	25.5 ± 3.5 seconds
Head Transposition	2 (8%)	6.5 ± 3.6 minutes
MMC Technique	5 (20%)	8.7 ± 3.2 minutes
Conjunctival Autografting	18 (72%)	25.9 ± 10.5 minutes

### Discussion:

There are tens of surgical techniques of pterygium excision.<sup>14</sup> Few are with no postoperative recurrence and some techniques like bare sclera technique have virtually the highest of recurrence rates reaching upto 88% in literature.<sup>15</sup> However whichever the technique used, one step is common to all of them i.e., removal of pterygium head. A lot of techniques have been mentioned in literature for pterygium head excision.<sup>16</sup> Here we discuss another novel technique of pterygium head excision i.e., with the help of double corneal forceps. Avulsion technique first described by Zolli C.L in 1979, is one of the most common surgical approaches for pterygium excision and has been modified in a number of ways.<sup>17</sup> Our technique is also a modified form of Avulsion. It uses two corneal forceps to hold upper and lower edge of pterygium head and use tangential avulsing forces to forcefully pull off the head from the surface of cornea. In our study, 72% of patients did not require any addition corneal scrapping as our technique alone was sufficient to remove all pterygium tissue

from corneal surface. Since scrapping is major risk factor for corneal perforation, it was also minimized.<sup>18</sup> This whole step took less than 30 seconds with minimal bleeding and clear surgical field. It was then followed by different techniques to cover the bare sclera. And none of our patients showed any signs of recurrence in 3 months follow up period.

In another study authors have reported modified technique and documented very similar results to our study.<sup>17</sup> Our recurrence rate is much better than previously described in literature from 3.3 to 43.3%.<sup>19</sup>

A few theories have been postulated in development of recurrence and most common of all include residual pterygium tissue and postoperative inflammation.<sup>20</sup> Postoperative inflammation was minimized in our study by use of preoperative aseptic measures and postoperative antibiotics.

Limitations to this study include single center study, small sample size of just 25 and short follow up period of just 3 months. However, authors intend to do a large sample size study as a follow up to this one in near future.

### **Conclusion:**

Sharjeel's double corneal forceps technique is a novel, easy, fast and very effective method for pterygium head removal and establishing a clear and smooth corneal surface. It reduces mean surgical time and overall need for corneal surface scrapping after head removal.

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