INTRODUCTION
Outward deviation of eyes is termed as exotropia.\(^1\) One population based study reported an annual age- and gender-adjusted incidence of 64.1/100,000 patients younger than 19 years of age.\(^2\) The same study reported a prevalence of approximately 1.0% in patients younger than 11 years.\(^2\) This prevalence rate was decreased with advancing ages.\(^2\) Untreated exotropia along with cosmetic disfigurement can also result in significant amblyopia,\(^3\) which becomes almost impossible to treat if exotropia appeared before the age of 10 years.\(^4\) One of the best management options for correction of exotropias is its surgical correction.\(^5,6\) Surgical correction has always been a challenge. The type of surgery to be selected largely depends on the surgeons preferences and personal experiences. Few researches have reported a success rate of 92% in constant exotropia correction,\(^7\) while some has reported success rates of 74.2% when unilateral medial rectus muscle resection and lateral rectus muscle recession was performed compared to 42.2% when bilateral lateral rectus muscle recession was performed in intermittent exotropias.\(^8\) Thus, argument about which surgical type is the best for different types of exotropias continues.\(^9\)

The main objective of this study was to find out the success rates of different types of surgical corrections in either constant or intermittent exotropias. By identifying the most successful surgical procedure, it could be preferred over the other choices in order to achieve best surgical success rate as compared to bilateral lateral rectus recession.

METHODOLOGY
It was an observational study, conducted from January 2007 to December 2012, at Al-Ibrahim Eye Hospital, Karachi. Ethical approval was taken from the ethical committee of Isra Postgraduate Institute of Ophthalmology. Patients having primary exotropia (deviation 15 - 45 prism diopters [PD]) were included. Patients with either constant exotropia or basic intermittent exotropia underwent unilateral surgery of lateral rectus recession (maximum up to 10 mm) and medial rectus resection (up to 6 mm). Similarly, when patients had intermittent distance exotropia, underwent bilateral lateral rectus recession (maximum up to 10 mm). Final outcome was considered at the end of 2 months at which achievement of ≤ 10 PD of exotropia was considered as a success.

RESULTS: Out of 248 patients, 170 (68.5%) had either constant exotropia or basic intermittent exotropia, while 78 (31.5%) had intermittent distance exotropia. Mean angle of deviation before surgery was 49.23 prism diopters while after surgery, mean angle of deviation was 8.54 prism diopters. Overall success rate was 81.45% (n=202). In case of unilateral lateral rectus recession and medial rectus resection surgery, the success rate was 85.14% while success rate in case of bilateral lateral rectus recession was 65.21% (p=0.001).

CONCLUSION: Unilateral lateral rectus recession and medial rectus resection for surgical correction of exotropia had better surgical success rate as compared to bilateral lateral rectus recession.

Key Words: Exotropia. Intermittent. Success rate. Surgery.
assessments including measurement of squint using prism cover technique. Patients with either constant exotropia or basic intermittent exotropia underwent unilateral surgery of lateral rectus recession (maximum up to 10 mm) and medial rectus resection (up to 6 mm). Similarly, when patients had intermittent distance exotropia, they underwent bilateral lateral rectus recession (maximum up to 10 mm). Surgery was done under local anaesthesia in adults but children were operated under general anaesthesia.

Patients were re-evaluated at one week, one month and two months postoperatively. Final outcome was considered at the end of 2 months at which achievement of ≤10 PD of exotropia was considered as a success. Data was entered on a preformed proforma. Analysis was done using Statistical Package for Social Sciences (SPSS) version 20. Qualitative data such as gender and success were presented by their frequencies along with percentages. The continuous variables such as age and degree of exotropia in Prism Dipters (PD) before and after surgery was presented as mean ±SD. Stratification was done with regards to age, gender, degree of exotropia (in PD) and the types of primary exotropia in order to see the impact of these variable on the outcome. Chi-square test was used for the analysis of the data. P-value of less than 0.05 was considered as significant.

RESULTS

Two hundred and forty eight patients were included in the study according to the inclusion and exclusion criteria. Out of these 248 patients, 122 (49.2%) were males while 126 (50.8%) were females. Minimum age of the patient was 1 year while maximum age was 46 years with mean age of 17.49 ± 10.26 years. Distribution among different age groups is shown in Table I.

Out of these 248 patients, 170 (68.5%) had either constant exotropia or basic intermittent exotropia, while 78 (31.5%) had intermittent distance exotropia. Minimum angle of deviation observed before surgical correction was 25 prism dipters, while the maximum was 65 prism dipters with mean angle of deviation was 49.23 ± 10.43 prism dipters. Similarly, after surgical correction, many eyes were straight while the maximum angle of deviation observed was 45 prism dipters with mean angle of deviation 8.54 ± 9.55 prism dipters. Postsurgical correction remnant deviation of less than 10 prism dipters was considered as successful surgery. Overall success rate was 81.45% (n=202), while success was variable when success rates were assessed on the basis of type of surgery performed. In case of unilateral lateral rectus recession and medial rectus resection surgery the success rate was 85.14% (172 out of 202) while success rate in case of bilateral lateral rectus recession was 65.21% (30 out of 46). No statistical significant difference was seen in success rates of squint surgery in different age groups (p=0.5071, Table II).

DISCUSSION

Childhood exotropias when present can cause significant visual impairment due to amblyopia.10-14 In order to prevent amblyopia development early and appropriate treatment of exotropia is necessary. Surgical correction has variable success rate, resulting in preferring one type of surgical method over other in different types of exotropias.15-17

In this study, the overall success rate was found to be 81.45%, while success was variable when success rates were assessed on the basis of type of surgery performed. When unilateral surgery was performed involving lateral rectus recession and medial rectus resection, the success rate was 85.14% while success rate reduced to 65.21% when bilateral lateral rectus recession was performed. Success rates were higher in age groups of greater than 25 years. Similarly, more success was observed in constant exotropias compared to intermittent exotropias.

Extremely variable success rates have been reported earlier in different studies. Choi reported higher success rate of bilateral lateral rectus recession (58.2%) compared to unilateral lateral rectus recession and medial rectus resection (27.4%) in patients with exotropia.16 Quah showed that the patients who underwent unilateral lateral rectus recession and medial rectus resection had a success rate of 74.2% compared to 42.2%, when bilateral lateral rectus recession was performed.8 Jeoung reported that, satisfactory outcome was achieved in 83.3% when unilateral lateral rectus recession and medial rectus resection was performed, while satisfactory outcome was achieved in 48.3% when bilateral lateral rectus recession was performed.18 Oriel Spierer reported a success rate of 74% when bilateral lateral rectus recession was performed for intermittent exotropia.20
Thus, different success rates have been reported by different researchers all over the world. No such data is available for our community, thus, this paper is important in selecting the surgical procedure for exotropia. The main limitation of this study was that it was conducted in a single institute and only patients belonging to same race were included.

CONCLUSION
No matter which type of exotropia is, correction of exotropia is very important in order to prevent the complications of exotropias such as amblyopia. In this study, we have compared the two different methods of surgical corrections of exotropia and it has been observed that one method that is unilateral lateral rectus recession and medial rectus resection has better surgical success rate as compared to the other method which is bilateral lateral rectus recession in exotropia correction.

REFERENCES