

Results of repeat penetrating keratoplasty after failed corneal graft

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Introduction

- Penetrating keratoplasty(PK) is an established re-grafting procedure after failure¹⁻² of primary surgery.
- Recently endothelial keratoplasty are becoming popular ³ for early visual rehabilitation, less suture related complications, less endothelial rejection.
- Several literatures have described the indications, outcome, risk factors for the graft survival in repeat corneal grafting ⁴⁻⁷.

Purpose

To report the results of repeat penetrating keratoplasty in failed graft done in largest tertiary care eye hospital in eastern India emphasising graft survival and complications

Methods

- Retrospective review of medical records of repeat penetrating keratoplasty [re-graft] cases done in Disha Eye hospital, Barrackpore, India in the year 2014 to 2016
- Total cases [n= 52]. (Male: Female-35:17)
- Mean age (years) = 45.84 ± 16.30 .
- Mean follow up after re-graft = 1.24 ± 0.68 years.
- Median interval after the previous graft = 9.5 months
- Parameters evaluated (1st, 3rd, 6th month and 1st year):
 - Initial graft types
 - Time interval since primary graft
 - Preoperative vision
 - Graft size, clarity, donor cell density
 - Complications

Methods

- **Definitions used:**

- **Clear graft-** Grade 4 (clear graft with clear view of the iris details) and grade 3 (minimal haze with reasonably good view of the iris details).
- **Graft rejection** - endothelial or epithelial rejection line or both, graft oedema with anterior chamber reaction
- **Failed graft-** irreversible edema with /without vascularization or scarring.
- **Secondary glaucoma-** Intraocular pressure higher than 21 mm Hg on two separate occasions

Methods

- Macular OCT done in clear graft with unsatisfactory vision.
- Topical prednisolone acetate and oral prednisolone in tapering doses, moxifloxacin 0.3% and ocular lubricants were given postoperatively.
- The outcome data analysed by paired t- test and p-value smaller than 0.05 was considered statistically significant.
- Kaplan-Meier survival analysis done to analyse Graft survival after repeat PK in 1,3,6 month and 1year follow up.

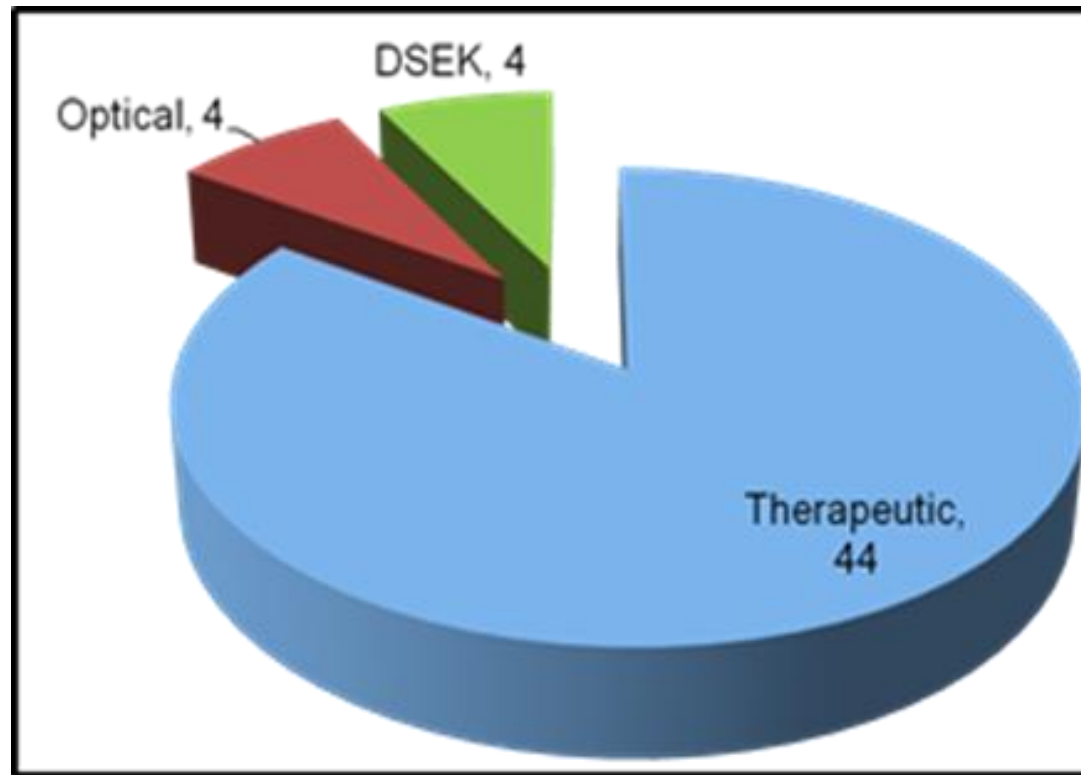
Results

- Only PK -21 eyes.
- PK with additional procedures-31.
- Additional procedures
 - Intraocular lens (IOL)
 - Anterior vitrectomy (AV)
 - synechiolysis

Procedure performed at regrant	No of eyes
PK	21
PKIOL	23
PKAV	5
PKIOLSYNECHIOLYSYS	3

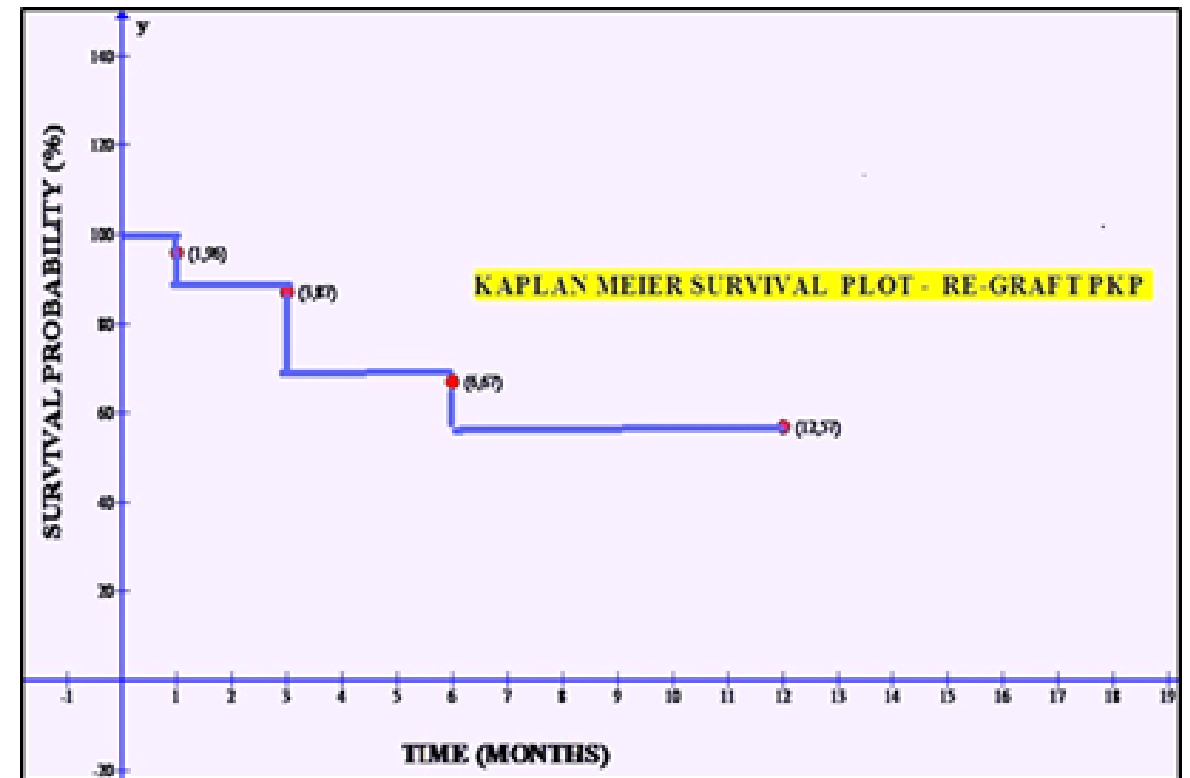
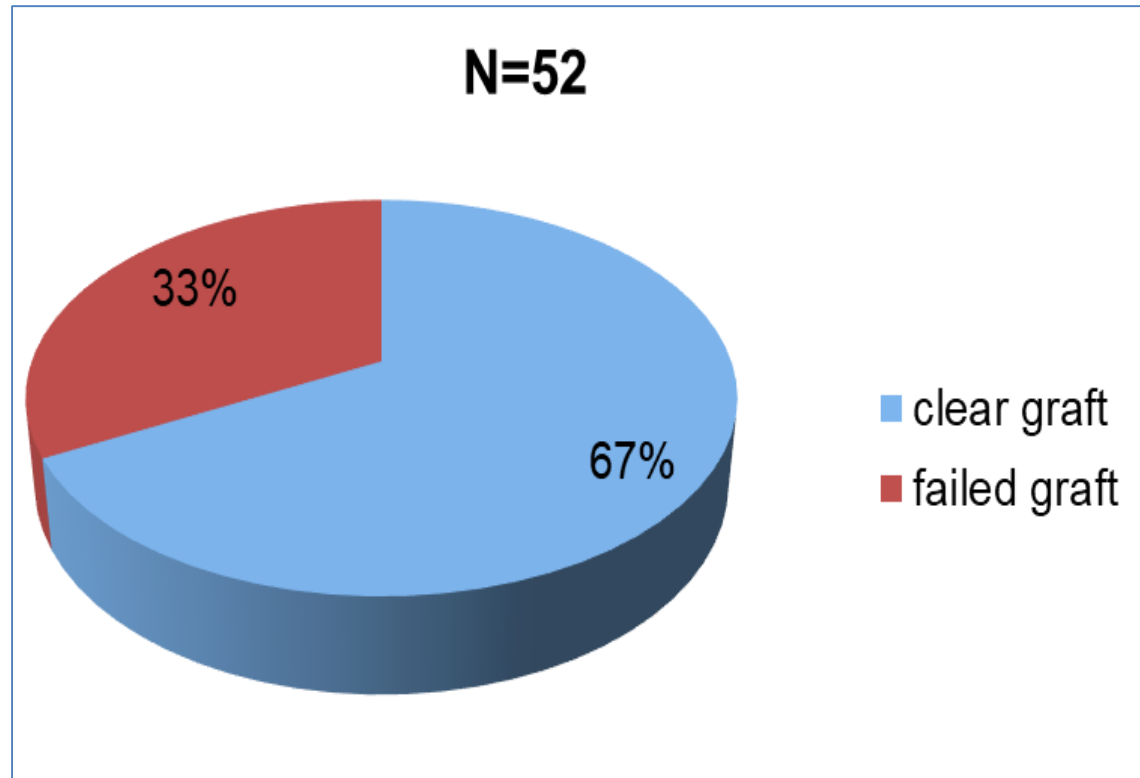
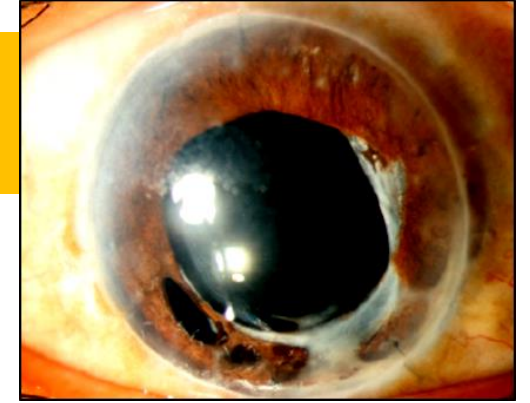
Results

- Preoperative indications for regrant includes:



Results

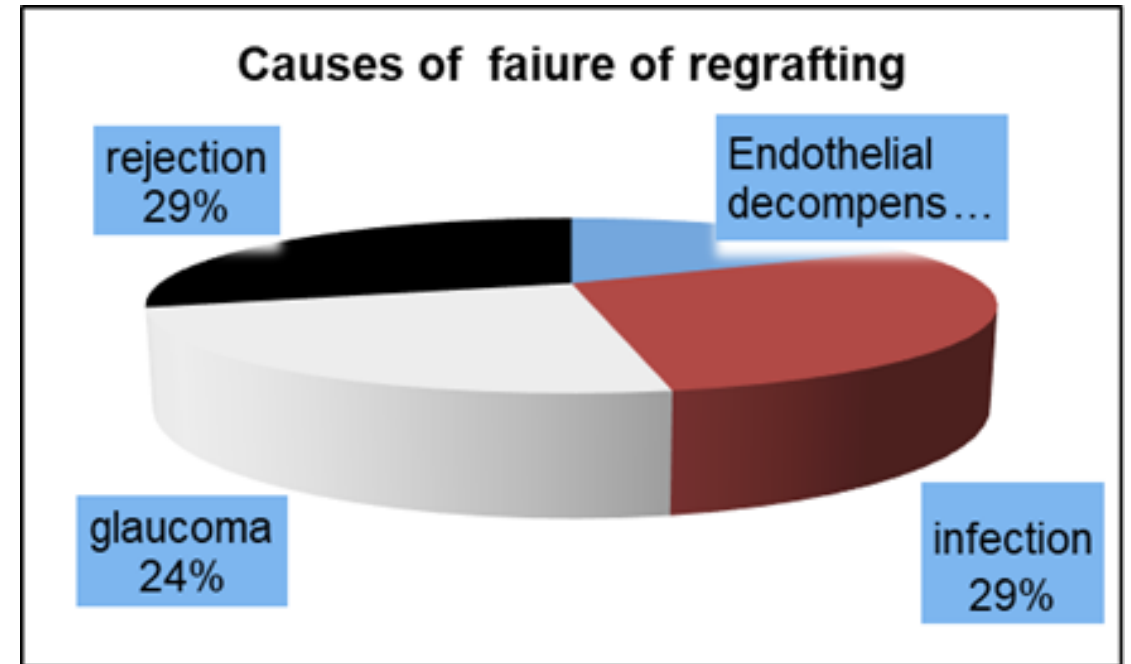
Graft clarity : At one-year graft remained clear in **35(67.3%)** and failed in **17(32.7%)** cases



Results

Causes of failure after repeat grafting in this study:

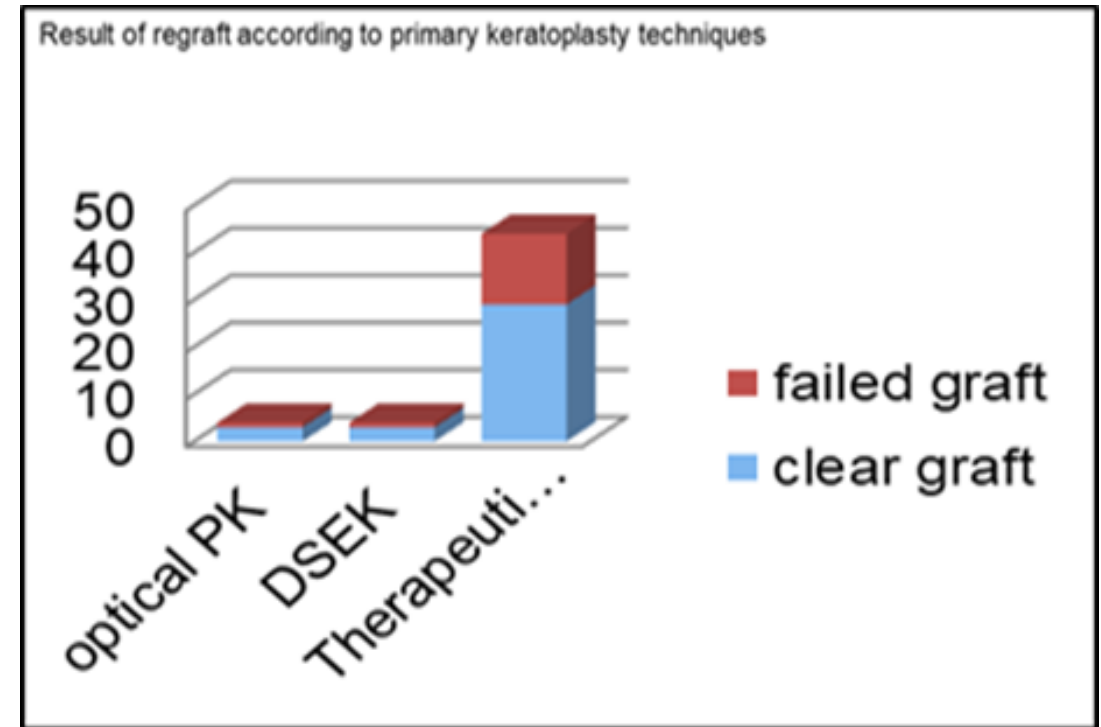
Cause of failure	Number	Percentage
Endoth decompensation	n=3	17.6%
infection	n=5	29.4%
glaucoma	n=4	23.5%
Rejection	n=5	29.4%



Results

Insignificant difference(**p-0.16**) in postoperative graft clarity whether primary cases are failed- optical/DSEK/therapeutic

Failed preoperative cases (p value 0.16)	Clear graft/total case	Percent
Op pk	3/4	75%
Dsek	3/4	75%
TPK	29/44	65.9%



Results

Visual acuity:

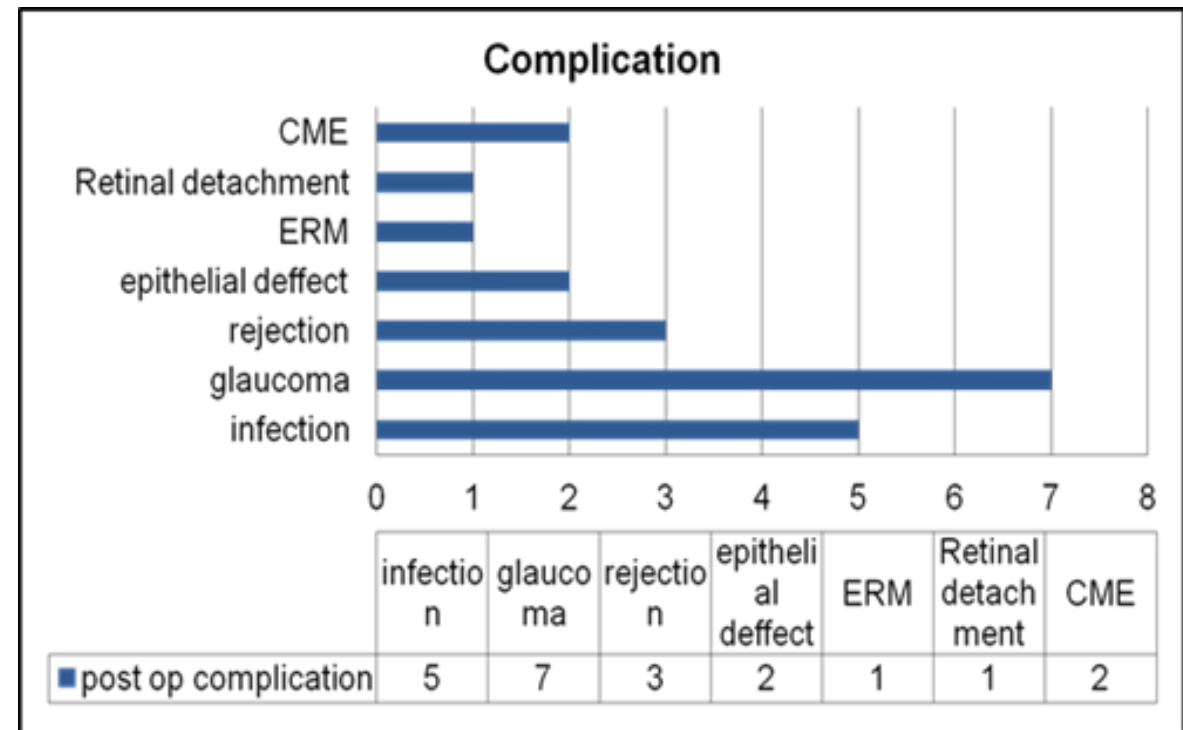
- Post op BCVA of LogMAR+0.5(6/18) or better = 11 (21.15%) eyes at the end of 1 year
- BCVA from Log MAR +1(6/60) to +0(6/6) = 27(51.92%) clear grafts
- Suboptimal BCVA in 12 clear regrafts - macular atrophy 3, astigmatism 3, cystoid macular edema 2, ERM 1 and secondary glaucoma in 2

Preoperative VA	No	Post operative visual acuity at 1 yr	No
PL PRACC	24	NPL	3
LogMAR +2 (FC2FT)	21	PL	7
LogMAR +3 (HM2FT)	7	LogMAR + 3.0(HM2FT)	9
		LogMAR + 2.0(FC2FT)	6
		LogMAR + 1.0(6/60)	10
		LogMAR + 0.8(6/36)	4
		LogMAR + 0.6(6/24)	2
		LogMAR + 0.5(6/18)	5
		LogMAR + 0.3(6/12)	3
		LogMAR + 0.2(6/9)	2
		LogMAR + 0.0(6/6)	1

Results

- Graft complications occurred in **21(40.3%)** eyes and causes are shown below

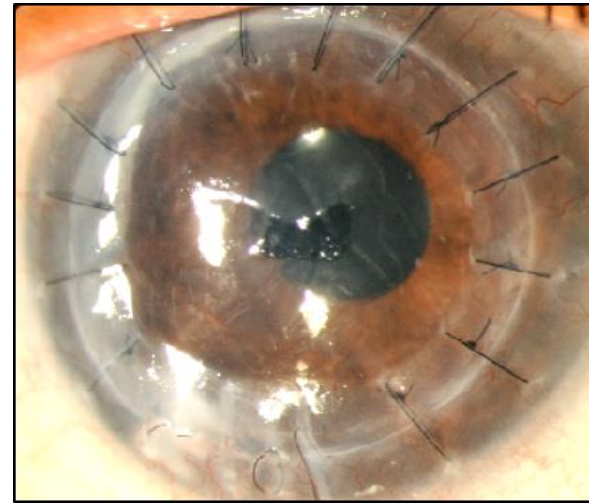
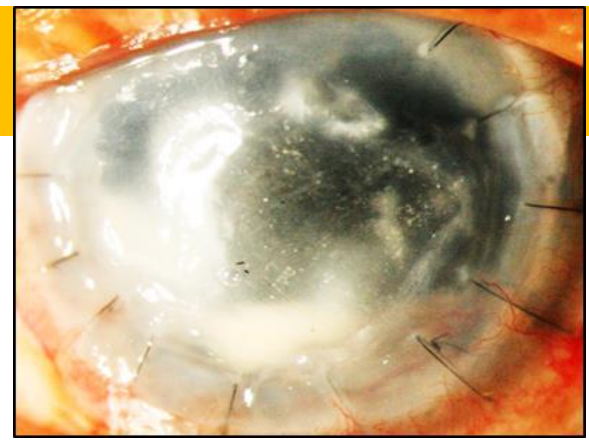
Post operative complications	Number (n=21)	Percentage (40.3%)
Infection	n=5	9.62%
Glaucoma	n=7	13.40%
Rejection	n=3	5.70%
Epithelial defect	n=2	3.80%
ERM	n=1	1.92%
CME	n=2	3.80%
RD	n=1	1.92%



Results

Complications noted more in earlier months:

Complications	1 st month	3 rd month	6 th month
Epith defect	3		1
Graft edema	2		
Glaucoma	2	3	Trab done-1
Rejection		3	
Graft infection		5	
Cystoidmacular edema	3		
Retinal detachment	1		



Discussion

- Regrafting now becoming a frequent indication for keratoplasty in the US as it gained 3rd position in 2016 (10.1%) from 4th in 2015 and PK topped the list (1.6% for ALK, 8.8% for EK and 11.8% for PK.⁸)
 - Dandona et al in 1997 reported regrant as the second most common indication for PK in India (17.1%), after scar.⁹
 - Graft clarity and visual outcome in regrafts are reported from 51% to 74% with vision 6/12 or better in 15% to 41%.⁷
 - This study showed 67.3% clear graft and 6/12 or better visual acuity in 21.15%
- Graft rejection and recurrence of dystrophies are the main causes for failure of regrafts⁵ in developed countries as compared to graft infection and glaucoma in developing country.⁹
 - Main causes for failure in developed countries -Graft rejection and recurrence of dystrophies⁵ as compared to graft infection and glaucoma in developing country.⁹
 - In our study graft infection, endothelial rejection, glaucoma were main causes.
 - All aphakic regrant cases had poor prognosis.

Conclusion:

- Re-grafting after failed Graft are rewarding although high rate of complications often leads to graft failure.
- Careful case selection, extended use of adjuvant immunosuppressive, and limited interventions may improve the survival of repeated corneal grafts.

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Thank you