

Single pass preparation of donor corneas for Descemet's stripping automated endothelial keratoplasty (DSAEK) with a new microkeratome.

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Purpose

- To report the accuracy of dissection depth using the Gebauer SLc 'Original' microkeratome to prepare donor tissue for Descemet's stripping automated endothelial keratoplasty (DSAEK).
- 15 consecutive DSAEK procedures at the Geneva University Hospitals, Switzerland by a single surgeon (Z.V.) between October 2014 and July 2015

Protocol:

- Intraoperative donor pachymetry
- Cutting head selection aiming to achieve 100 micron lamella (*heads: 350-600 microns, 50 microns steps*)
- postoperative AS-OCT measurement of graft thickness on day 0, week 1, month 1 and months 3



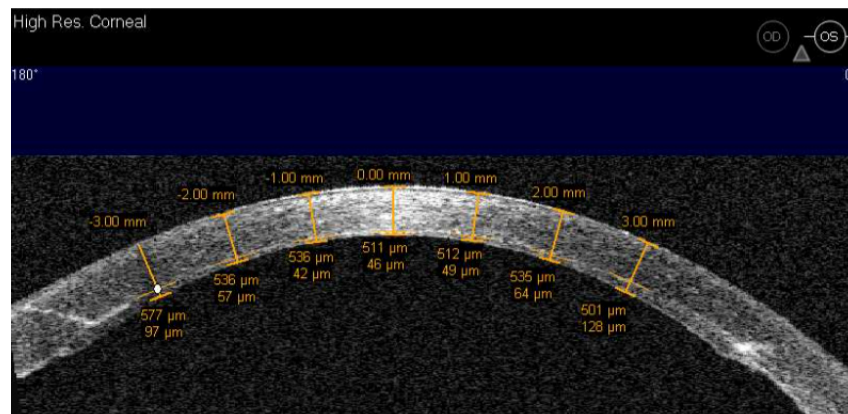
Patient characteristics

- 8 male, 7 female, mean age 74 (± 8) years
- 2 cases (13%) Fuchs' endothelial dystrophy ,
- 13 cases (87%) pseudophakic bullous keratopathy
- 5 eyes advanced macular pathology, 2 advanced glaucoma

Donor characteristics:

- Thickness: average 779 (± 142) microns, Range 500 – 995 microns
- **Group A** : 5 donors with thickness < 700 microns, ave 620(± 72) microns
 - *Predicted posterior lamellar thickness of ≤ 100 microns is possible*
- **Group B** : 10 donors with thickness > 700 microns, ave 858(± 90) microns
 - *Predicted posterior lamellar thickness of ≤ 100 microns is **NOT** possible as maximum cutting depth is 600 microns*

AS-OCT measurements



- High resolution corneal scan images, host and graft thickness was measured with the flap tool using the Zeiss Visante anterior segment OCT, on day 0, 1 week, 1 month and 3 months postoperatively
- 7 points were measured : midpoint, ± 1 mm, ± 2 mm, ± 3 mm

Results

• Group A (donors < 700 microns, n=5)

case	donor thickness	cut depth	<i>predicted</i>	<i>Δpachy</i>	Graft thickness			
					day0	week1	month 1	month 3
1	500	400	100	9	91	104	65	62
2	659	550	109	2	107	87	54	57
3	639	550	89	18	107	89	67	51
4	686	600	86	35	121	77	91	97
5	615	550	65	4	69	61	49	58
<i>mean</i>	<i>619.8</i>		<i>89.8</i>	<i>13.6</i>	<i>99</i>	<i>83.6</i>	<i>65.2</i>	<i>65</i>

Results

• Group B (donors > 700 microns, n=10)

case	donor thickness	cut depth	<i>predicted</i>	<i>Δpachy</i>	Graft thickness			
					day0	week1	month 1	month 3
1	830	600	230	62	168	120	91	60
2	809	600	209	78	131	143	160	110
3	836	600	236	51	185	105	83	85
4	960	600	360	178	182	110	118	119
5	747	600	147	44	103	81	67	51
6	995	600	395	80	315	217	195	123
7	931	600	331	88	223	118	134	141
8	871	600	271	8	283	100	94	89
9	710	600	110	3	113	63	68	
10	890	600	290	101	189	170	140	
<i>mean</i>	<i>857.9</i>		<i>257.9</i>	<i>69.3</i>	<i>189.2</i>	<i>122.7</i>	<i>115</i>	<i>97.25</i>

Conclusions

- Single pass lamellar dissections performed with the Gebauer SLc 'Original' microkeratome showed good accuracy in donor corneas under 700 microns with a mean of 13.6 microns difference between achieved and predicted lamellar thickness
- Even when donor corneas have significant oedema with central thickness over 700 microns the accuracy of cut depth was acceptable with a difference between achieved and predicted lamellar thickness of 69.3 microns on average
- 3 months post-operatively the mean graft thickness has decreased to below 100 microns even when oedematous donor tissue was used.