

## 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



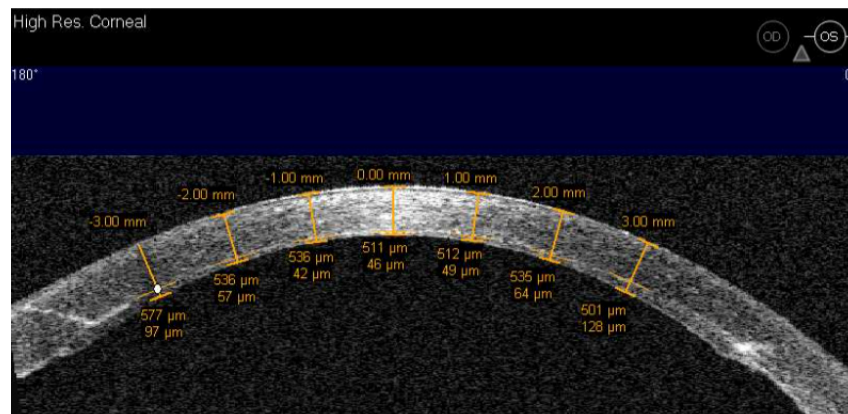
### Patient characteristics

- 8 male, 7 female, mean age 74 ( $\pm 8$ ) 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 ( $\pm 142$ ) microns, Range 500 – 995 microns
- **Group A** : 5 donors with thickness < 700 microns, ave 620( $\pm 72$ ) microns
  - *Predicted posterior lamellar thickness of  $\leq 100$  microns is possible*
- **Group B** : 10 donors with thickness > 700 microns, ave 858( $\pm 90$ ) microns
  - *Predicted posterior lamellar thickness of  $\leq 100$  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,  $\pm 1$ mm,  $\pm 2$ mm,  $\pm 3$ 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	<b>100</b>	<b>9</b>	91	104	65	62
2	659	550	<b>109</b>	<b>2</b>	107	87	54	57
3	639	550	<b>89</b>	<b>18</b>	107	89	67	51
4	686	600	<b>86</b>	<b>35</b>	121	77	91	97
5	615	550	<b>65</b>	<b>4</b>	69	61	49	58
<b>mean</b>	<b>619.8</b>		<b>89.8</b>	<b>13.6</b>	<b>99</b>	<b>83.6</b>	<b>65.2</b>	<b>65</b>

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

### 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.