

Projecting DSAEK Graft Thickness:
Grafts up to 140 µm preoperatively, predictably become ultrathin (100 µm)

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Introduction

Discussions about “ultrathin” DSAEK grafts are common in current literature and have been used to explain visual outcomes post surgery. Unfortunately, no clear definition exists describing what constitutes “ultrathin” DSAEK tissue *preoperatively*. Our goal was to clearly define what we thought constituted ultrathin DSAEK tissue postoperatively (100 µm or less), and then identify common tissue characteristics observed in these grafts at Lions VisionGift. By taking this approach, given a known DSAEK graft thickness measurement taken by OCT at our eye bank, we now can reliably predict grafts that will ultimately become ultrathin.

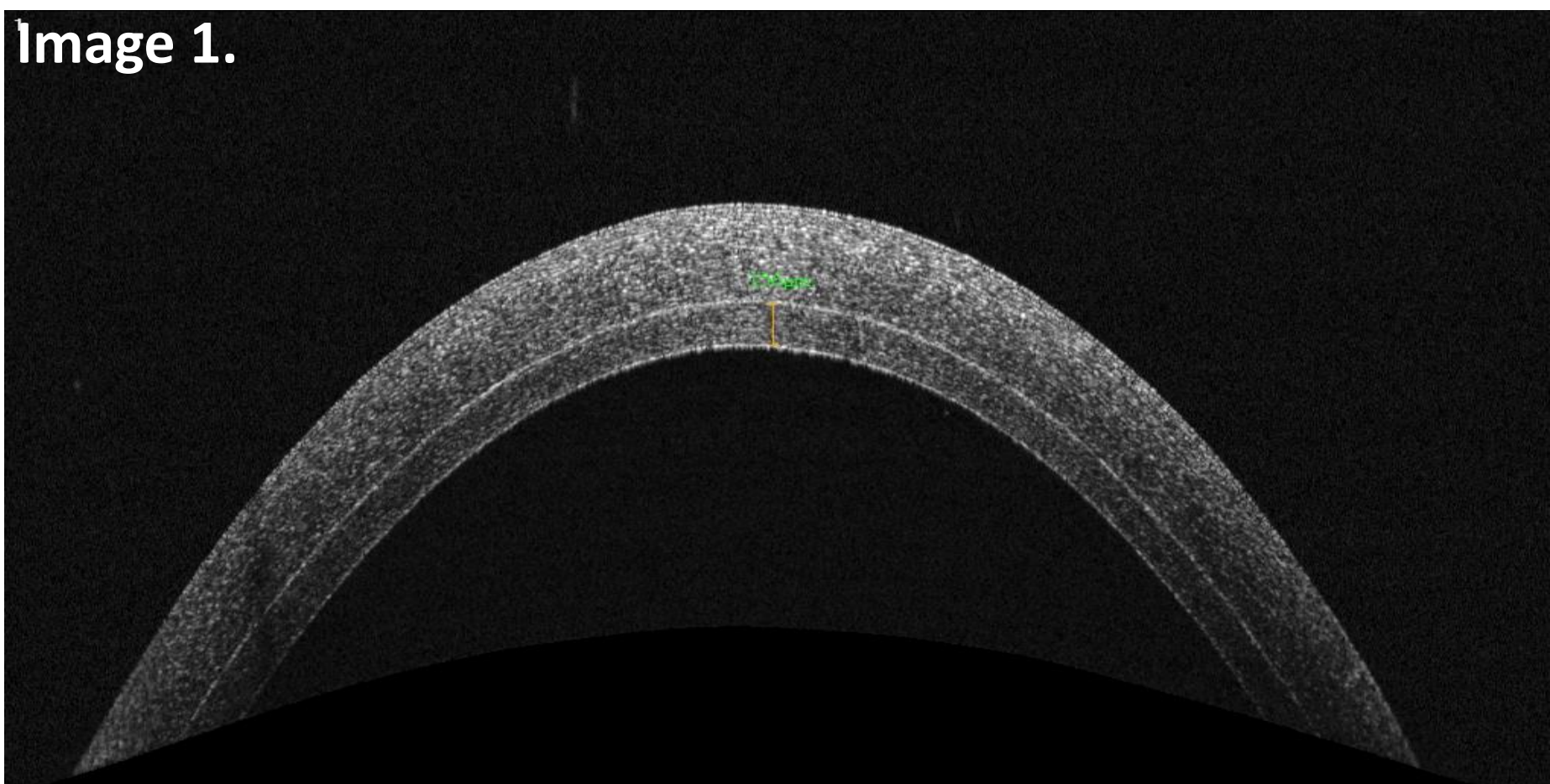
Methods

We retrospectively reviewed 94 consecutive DSAEK transplants and recorded their thinning at time points between 3 and 9 months. We used ocular coherence tomography (OCT) to measure graft thicknesses preoperatively at Lions VisionGift (LVG) and postoperative at Devers Eye Institute (DEI). After Identifying grafts postoperatively for analysis, graft thicknesses were clustered into preoperative decile groups of 10 µm thicknesses. After this grouping, thinning between decile groups were compared. We then identified the preoperative graft thickness that predicted grafts to be “ultrathin” (100 µm or less) postoperatively, and determined what percentage of those grafts thinned, and what degree of thinning occurred.

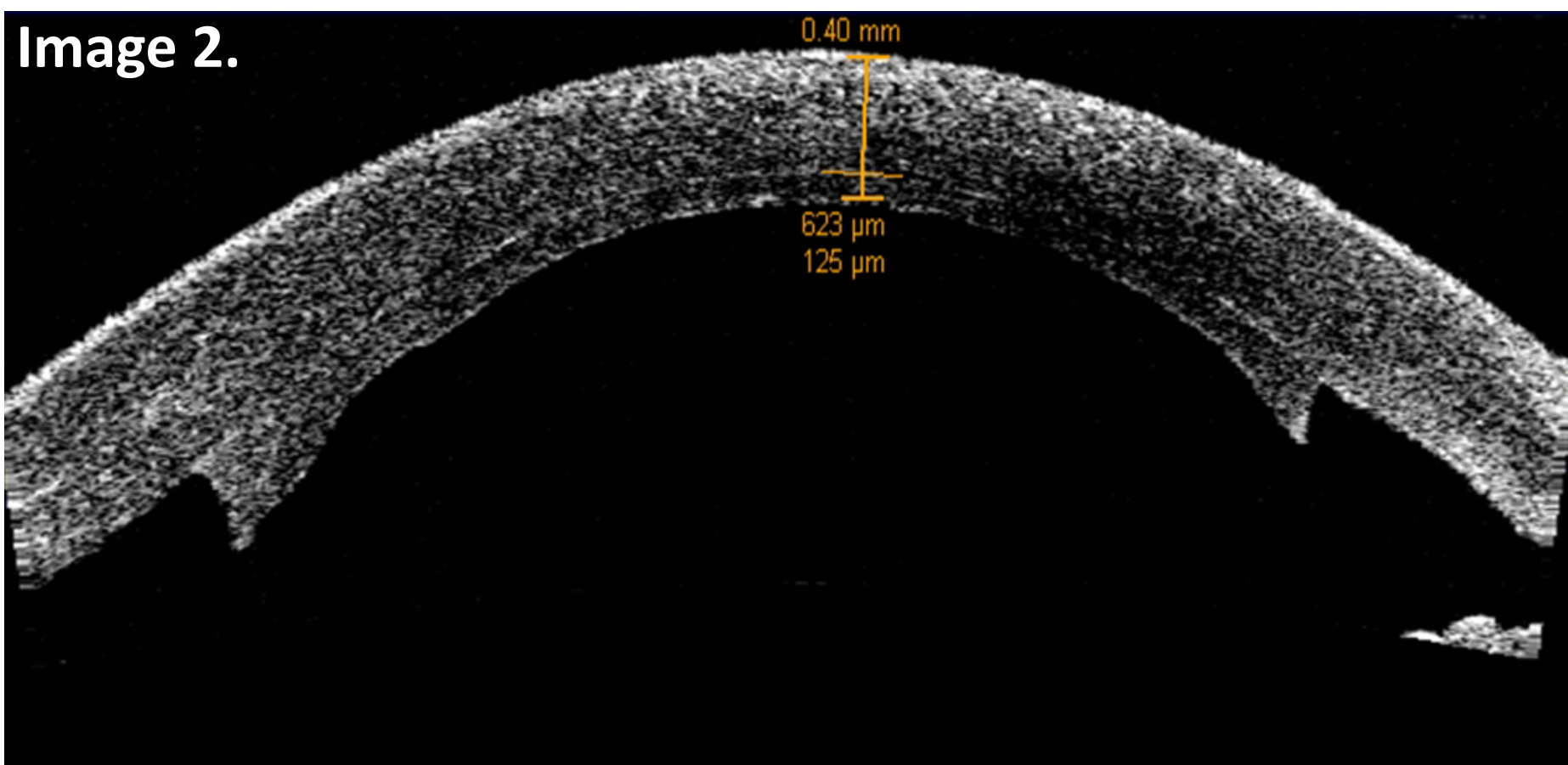
Disclosures - None



OCT Measures of DSAEK Grafts Were Taken
At Lions VisionGift Eye Bank

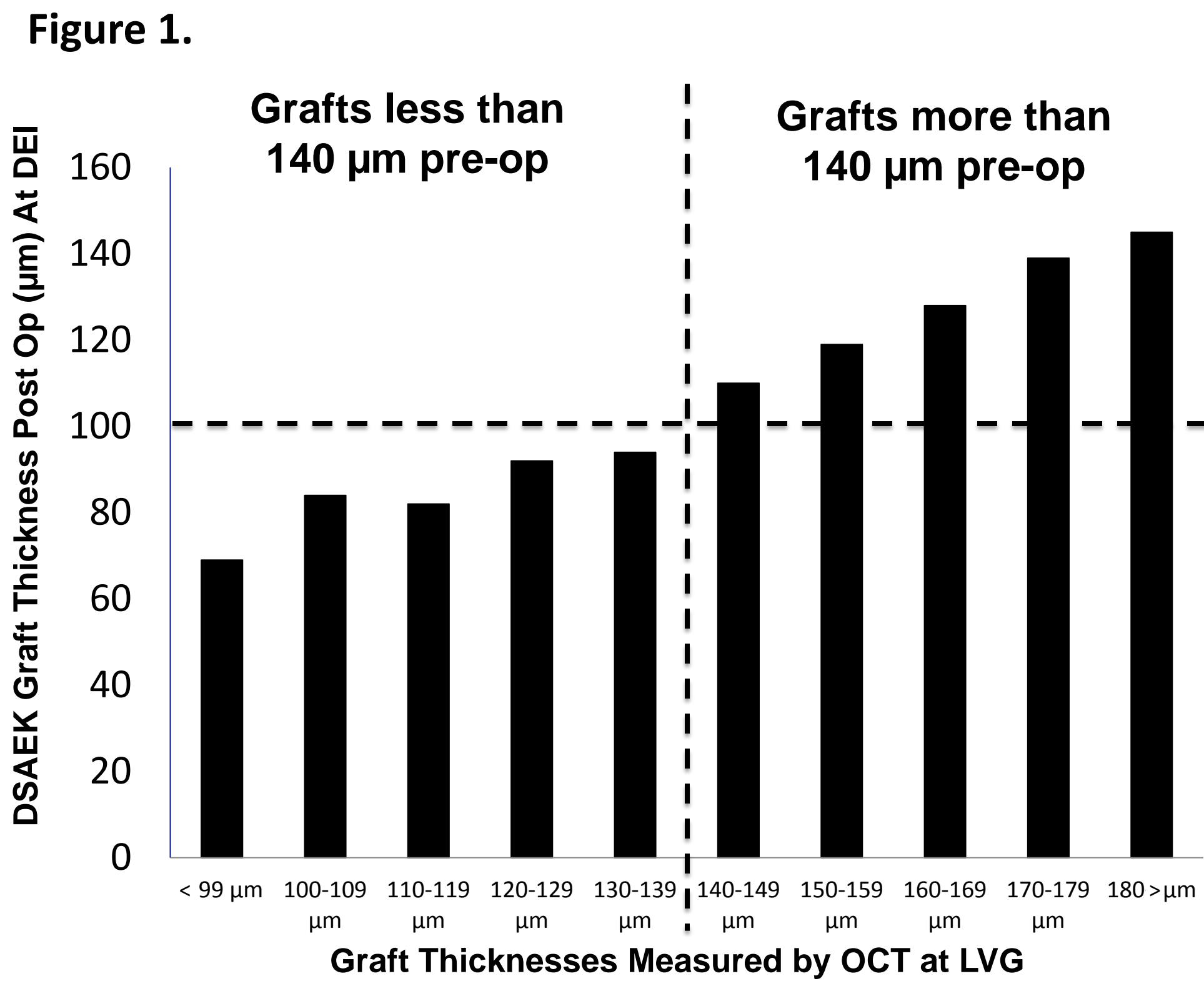


3 – 9 Months Post Surgery, OCT Measures
Were taken Again at Devers Eye Institute

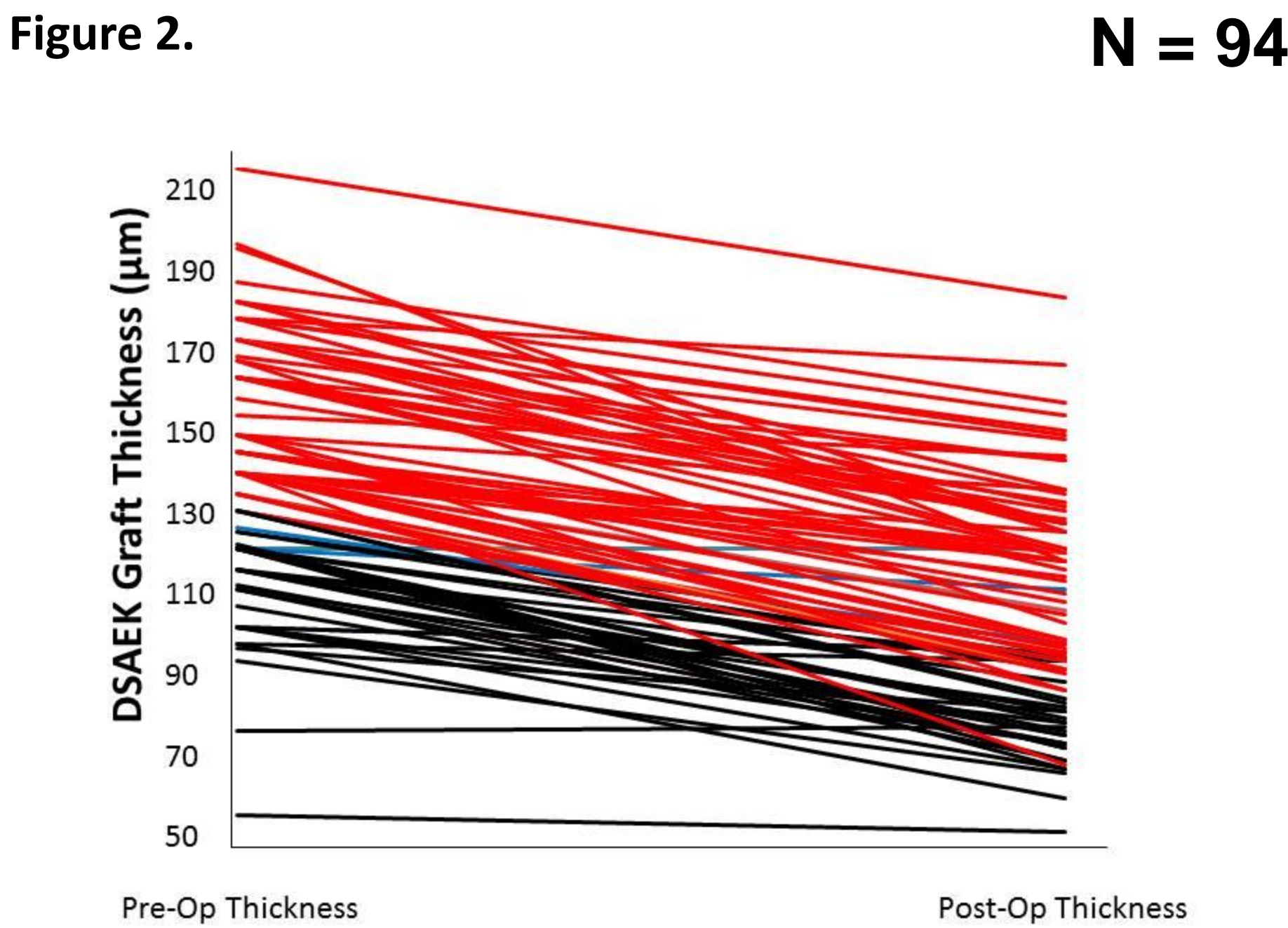


Results

Average DSAEK Graft Thicknesses
Measured Postoperatively and Binned
Into 10 µm Groups



DSAEK Graft Thickness Measures, Pre-Op vs.
Post-Op Comparisons



Each line represents a single graft and its change in thickness between the preoperative measurement and the postoperative measurement. Black lines represent grafts under 140 µm in thickness that thinned to less than 100 µm. Blue lines represent grafts starting under 140 µm in thickness and NOT thinning to less than 100 µm. Red lines represent grafts starting over 140 µm in thickness.

90% of Grafts Under 140 µm Thinned to 100
µm or Less

8% of Grafts Over 140 µm Thinned to
100 µm or Less

Percent Thinning of Grafts by Group and their
Associated Visual Acuities at Post Operative
Time Points

Table 1.

Group	N	Mean % change in Graft Thickness	Mean % Change in ECD	Achieving > 20/20 (%)	Achieving > 20/25 (%)	Achieving > 20/40 (%)
99 or Less	3	11%	22%	0 (0)	3 (100)	3 (100)
100 - 109	8	18%	26%	2 (25)	5 (63)	5 (63)
110 - 119	11	29%	25%	1 (9)	4 (36)	7 (64)
120 - 129	13	26%	14%	2 (15)	7 (54)	10 (77)
130 - 139	9	30%	16%	1 (11)	4 (44)	6 (66)
140 - 149	17	22%	17%	1 (6)	6 (37)	15 (88)
150 - 159	5	22%	9%	1 (20)	4 (80)	4 (80)
160 - 169	9	23%	22%	1 (11)	4 (36)	7 (78)
170 - 179	12	21%	20%	0 (0)	7 (58)	10 (83)
180 or More	7	24%	17%	0 (0)	1 (14)	5 (71)

Preoperatively Thin Grafts, Thin Less

Do “Ultrathin” Grafts Really Give Better
Visual Acuity Results?

Conclusion

Preoperative graft thickness averaged 143 µm with a range of 66 µm to 215 µm. Mean postoperative thickness was 108 µm, representing an average thinning of 23%. In the 41 grafts with preoperative thickness of less than 140 µm , 90% thinned down to less than 100 µm postoperatively. Conversely, only 8% (4/53) grafts with preoperative thicknesses greater than 140 µm thinned to less than 100 µm. Only a minor amount of graft thinning was observed in groups with initial thicknesses under 110 µm (16%) and leveled out in grafts 110 µm and greater (25%).

Clinical Significance

Some studies have found that donor grafts that are less than 100 µm postoperatively may result in better vision. Our results do not necessarily support this, as the 150-159 micron prep tissue demonstrates similar visual outcomes. Preoperative thickness may not have a relationship to post op vision. However, surgeons desiring these results can confidently request grafts with preoperative thicknesses up to 140 µm thick from the eye bank and be assured that they are transplanting tissue that will ultimately be ultrathin postoperatively. In addition, grafts thinner than 110 µm preoperatively have a smaller percentage of thinning than grafts thicker than 110 µm.

References

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