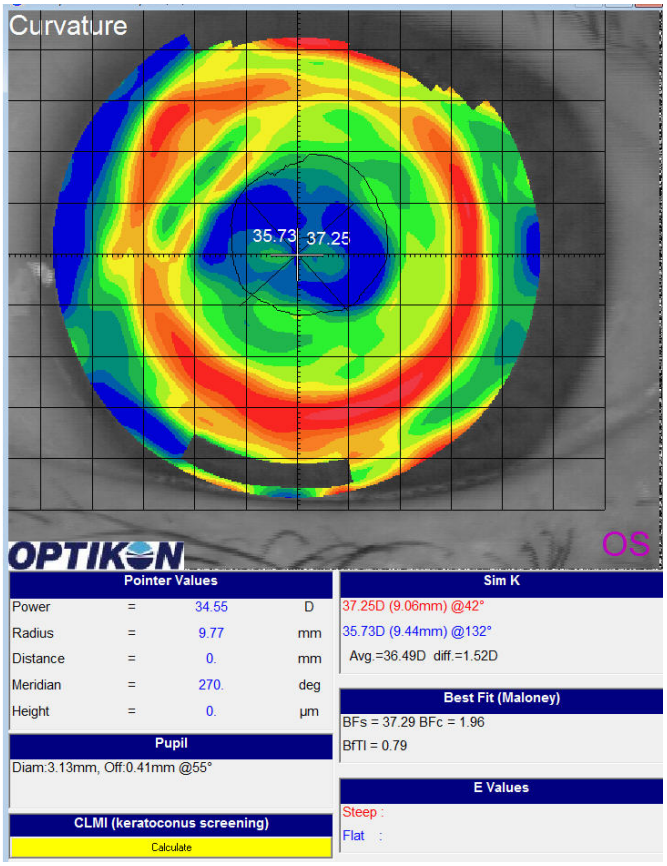
My continuing adventure fitting semi-sclerals for a long-term post-RK patient

Carol C. did well after having RK surgery 15-20 years ago. After about 10 years she had increasing difficulty with her vision. Glasses never worked well for her so she returned to the clinic that did the surgery to be fitted for contact lenses. She persisted wearing those for several years but increasingly had comfort and vision problems. I first saw her about 3 years ago and re-fit her with Wave lenses. She seemed to be a bit more comfortable and I was able to help her with a little better vision. I could never get bifocal lenses to work because the lenses would not center well enough. She did well with monovision, electing to have her OS corrected for distance and OD corrected for near. She also has an additional OD distance lens she uses for playing tennis.

She has also developed considerable blepharoptosis over the years trying to squint and compensate for her less than perfect vision. This definitely does not help the proper fitting of conventional RGP's. I see people out in the world everywhere I go that have that "look." She also uses Latisse for eyelash darkening/thickening. A final problem is constant oily tears. The Latisse did not make a difference. We have tried different eye drops, cleaning procedures, etc. The only thing that worked is pulse dosing Lotemax. Fortunately she has had no pressure spikes and doesn't have to use it often.

Her OS was the least comfortable for her and so I elected to have her wear a silicone hydrogel on that eye for about 1 month. We changed the power several times and finally obtained what I thought was a good quality topography.



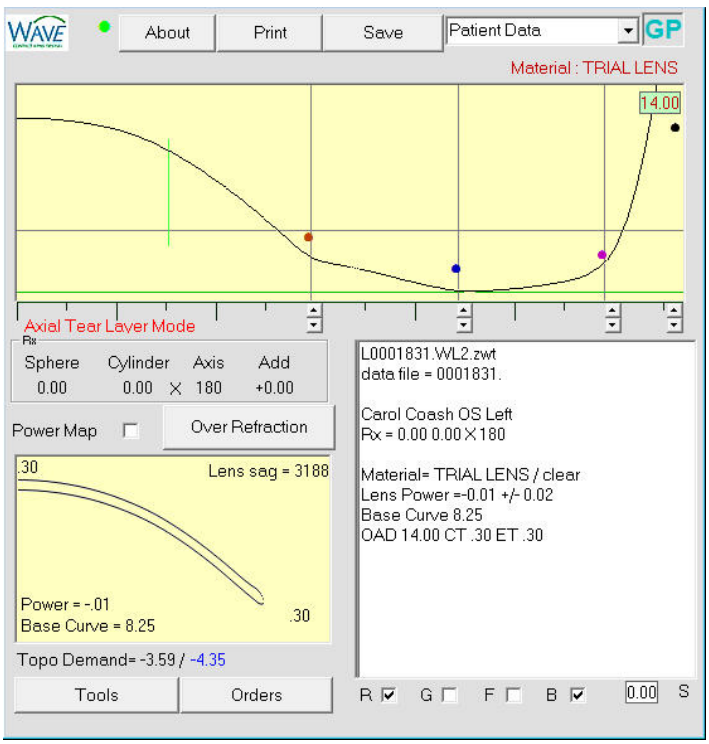
I queried our Wave Google group for suggestions and hints about what lens parameters I should work toward for a semi-scleral. At the time no one responded and so I asked Peter Wilcox, OD for help. He kindly gave me some direction.

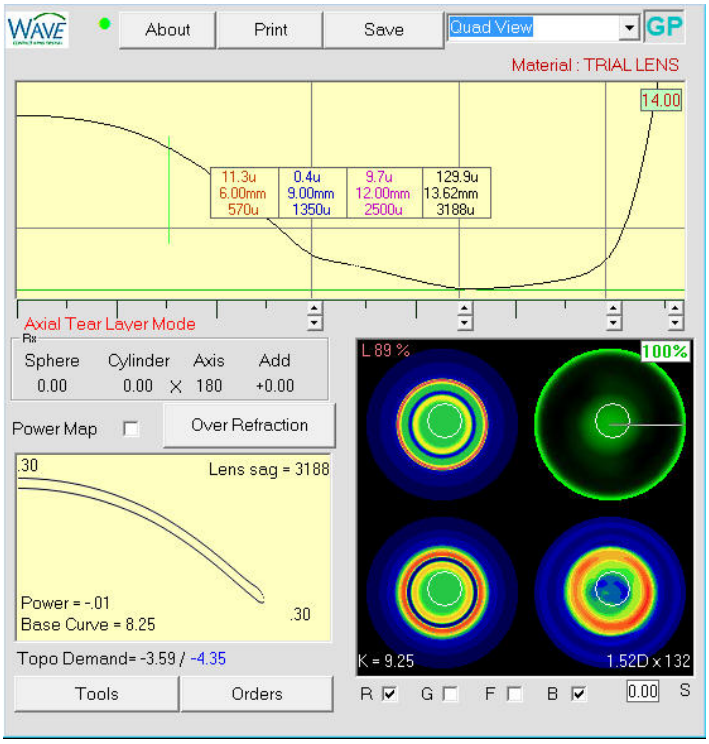
Her HVID measured about 11.2 mm so I elected to use a 14.0 diameter lens.

Peter suggested:

1. Placing the red dot just inside the red ring on the topography.
2. Placing the blue dot 1 mm smaller than the HVID
3. Placing the pink dot 1 mm larger than the HVID.
4. Edge angle of 43°.
5. Central thickness and edge thickness of 30.
6. Central clearance of 100µ.

I couldn't quite get my head wrapped around the 100µ clearance, so I amateurishly decided on about 55µ. The initial design is shown below:



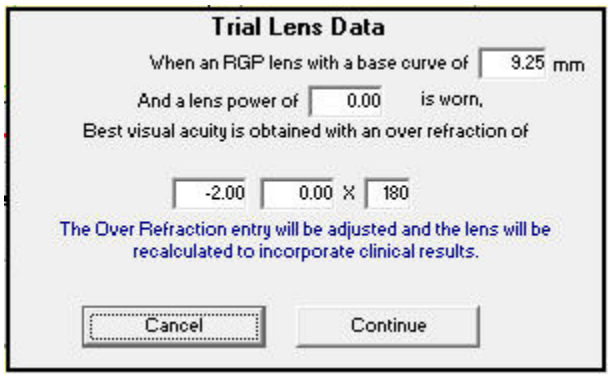


The trial lens arrived. The lens power measured Plano. I had instructed the patient to go on-line and find insertion and removal videos to watch so she would be ready. From now on I will suggest a site … http://www.sclerallens.org/how-use-scleral-lenses. I was armed with vials of pure non-buffered, non-preserved saline and a variety of DVM plungers for her to try. She was able to insert and remove the lens without any of the plungers. The only problem she had was not getting enough saline into the lens bowl which would cause air bubbles. After about 5 minutes of sitting with the lens on, she said it was very comfortable. Over-refraction was -2.00 sphere giving 20/25+ acuity. The lens appeared to fit very well and centered extremely well with no apparent corneal touch and no scleral impingement. I was ecstatic.

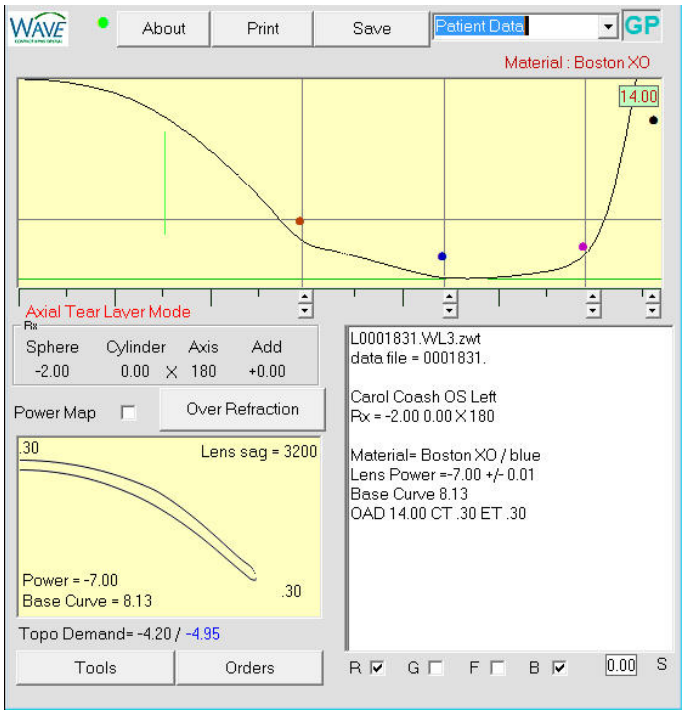
Time to order a "real" lens:

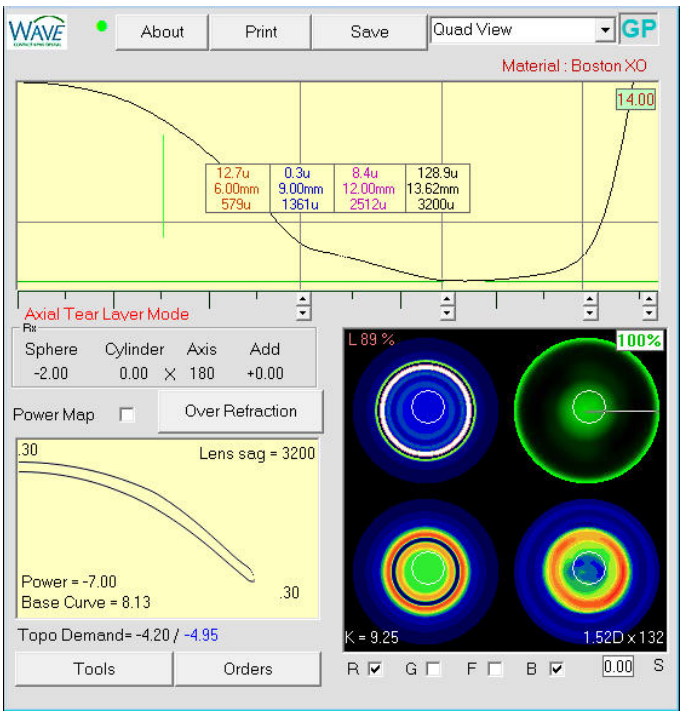
I had thought about the earlier suggestion to make the central clearance greater, because as the lens will eventually settle in there could be some corneal touch. I thought I would go ahead and increase that clearance and then change the power in Wave. I did this the wrong way. I went to my previous Trial Lens design (shown above) and pressed the down button at the red button to increase the central clearance. I increased it to about 67 and then clicked the Sphere button and changed the power to -2.00. I ended up with a lens that was 4 diopters too strong!

What I should have done was to follow the instructions for trial lenses provided by Wave and gone to "Tools" > "Trial Lens Data" and added the -2.00 on that screen first, as shown:

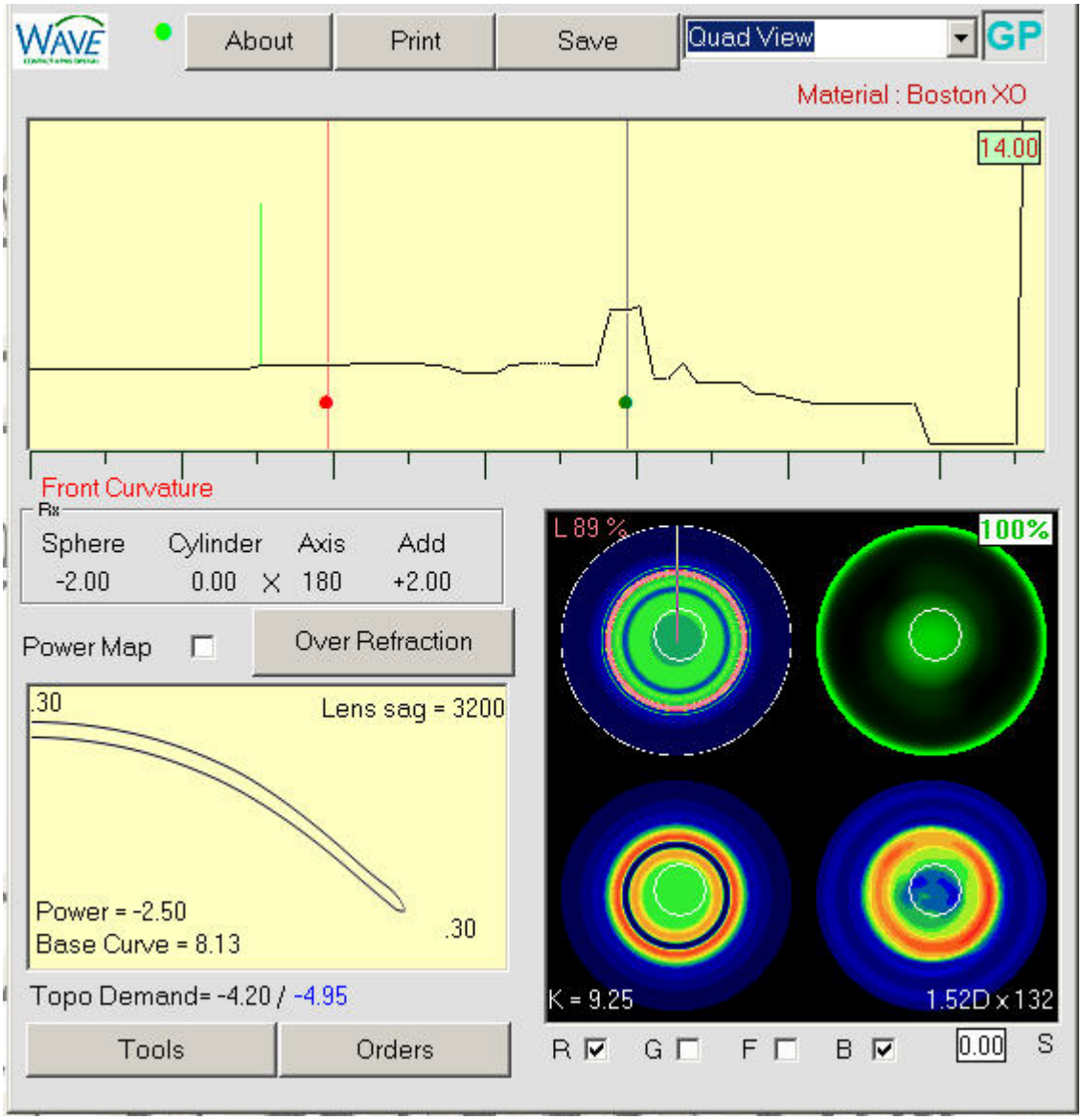


So, I redesigned the lens with this technique. I Changed the material from "Trial Lens" first to Boston XO and then changed the central clearance so that Wave would automatically adjust the power for the change in Base Curve. Another mistake after that. I failed to notice that Wave had changed the center thickness back to a default that it considered correct of about .14. About an hour after I hit the order button I went back and looked at that Wave design again and noticed I had failed to change the center thickness back to .30. I quickly called the lab and they graciously cancelled the order and I re-sent the order with the proper CT. One could review Jim's excellent trial lens video at http://screencast.com/t/TmW7o4IxqD8Y





Finally! The lens came in and worked beautifully! After wearing a week she was very comfortable with stable vision and good NaFl pattern and still no conjunctival impingement at the edge. Now I am ordering an additional lens with a center-distance design bifocal of +2.00 add. This is still her dominant eye so I am setting the add diameter a bit larger than her pupil size as shown in the Wave window below. Unfortunately there seemed to be no usable bifocal effect with this lens. The over-refract was -.50. She put her previous SV lens back on to drive home and said she would try the BF at home for a few hours and give me feed-back. I'm going to ask the Google group or Wave Fitting help for any advice for setting BF parameters for large lenses.



If successful I will re-fit her OD. I may be able to use the original OS trial lens for an initial lens OD and go from there. In the end, hopefully I can make her a center-distance add slightly smaller than her pupil size for that non-dominant eye. These larger lenses center beautifully so I am hopeful I can get the bifocal styles to succeed.