risk of visual morbidity. The patients had the option to proceed with refractive cataract surgery after 1 month or to delay lens extraction, in which case they would be followed for up to 36 months.

Three alternative algorithms selected from the computer-generated model were evaluated and applied in a randomized fashion. In all of the models, the central optical pathway of the lens was spared. The accommodative and visual effect of the treatment was assessed by objective accommodation (Grand Seiko autorefractor), subjective push-down near-point of accommodation, and logMAR distance-corrected near visual acuity (DCNVA) and distance visual acuity.

Immediately after this nonexternally invasive procedure, it was possible to visualize the intralenticular bubbles (Figure 27-6), which faded over the first 1 to 2 days, leaving only faint, pinpoint opacities (Figure 27-7). No intraoperative complications were reported, and the early postoperative results showed no progressive cataract formation. Mean (SD) [max, min] change in logMAR DCNVA at 1 month was -0.06 (0.24) [0.36, -0.62]. Mean (SD) [max, min] change in objective accommodation at 1 month was 0.20 (0.29) [0.63, -0.25] D. Mean (SD) [max, min] change in subjective accommodation at 1 month was 0.22 (0.67) [1.28, -0.93] D. The minimal changes in accommodation and near vision with these early treatments suggest that these patterns were ineffective and warrant further investigation to determine the most efficacious laser pattern. Early differentiation in outcomes among the 3 treatment patterns suggests that patterns with lower energy and pulsing might have a greater effect on restoring accommodation. The recruitment and testing of additional clinical patients is anticipated in the coming months.

Figure 27-6. Immediately postoperative aspect of different patterns. (A) Double pass “waffle” pattern. (B) “Washer” pattern.

Figure 27-7. In the following day after the procedure, the intralenticular bubbles are gone and only pinpoint opacities can be observed.

OUTCOMES ANALYSIS

Laser Parameters and Profiles

Quality and Predictability of Cutting

It is well known that cuts created by femtosecond lasers show fewer side effects than those generated by nanosecond pulses. The tightly focused, ultrashort pulses induce small and localized microcavitation bubbles that expand and separate cleavage planes