In cases with multiple retinal breaks and in combination with vitrectomy in eyes with proliferative vitreoretinopathy (PVR) often an encircling band is used for retinal detachment surgery. Usually the encircling band is fixed with non-resorbable sutures. A fixation method for an encircling band in retinal detachment surgery with one scleral tunnel in each of the 4 quadrants is reported. After 50 consecutive operations on 50 patients, we describe our experience and biomechanical calculations of this fixation technique. In comparison to conventional fixation technique we found the following advantages. No suture is necessary, this means that no additional foreign body can produce irritations. The scleral tunnel is safe and the preparation under the microscope can be performed rapidly and under good control. According to our biomechanical calculations, the same tension of the encircling band produces less myopic shift with this technique. Scleral tunnel fixation is very comfortable in combination with a vitrectomy. After a short learning curve, the operating time is as short as with conventional suture fixation of the encircling band. There is less perforating risk, less irritation and less patient discomfort postoperatively. A sutureless encircling band with scleral tunnel fixation is a very useful operative technique in clinical routine.