Lacrimal Stent with Opening

Need for Nasolacrimal stents

Nasolacrimal duct obstructions may be either congenital or acquired. Obstruction of the nasolacrimal duct leads to the excess overflow of tears, resulting in watery eyes and an increased risk of eye infections and inflammation. To prevent these simple serious issues, current procedures include placing lacrimal stents through the puncta into the obstructed duct of the eye; intended to open up the lacrimal duct. Conventional lacrimal stents, however, exhibit long-term failure due to the inability to insert the stent primarily, malposition within the nasolacrimal system and obstruction by granulation tissue. The invention under review emphasizes the proper placement of the stent into the puncta of the eye and overcomes the drawback of currently used stents (that channel the tears on the outside of the silicone tube) by facilitating efficient channeling of tears through the internal lumen of the stent.

Lacrimal Stent with opening

The invention under review includes small openings (slots) that are designed and created on the surface of the stent to channel the tears into the hollow cavity of the stent. The lacrimal stents have a diameter on the scale of 500 to 700 micrometers. The dimensions of these openings were chosen to ensure they were big enough so water may penetrate the surface, but also small enough that it still maintains the structural integrity of the stent. The surface tension of the tears did not hinder the ability of the tears to pass into the interior of the stent. If the openings are not created to proper size, with a diameter of larger than 300 micrometers, for the tear drops to enter, then the cohesive forces will not break apart and will keep the liquid from entering inside the tube. Finally, slot opening with a length over 2 mm showed better drainage efficiency.

Applications

- Treat lacrimal duct stenosis/obstruction,
- Treatment of chronic sinusitis

Advantages

- Stent opening ensure efficient tear draining through the internal lumen,
- Significantly improves epiphora symptoms,
- Ensures proper stent placement

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