

# Experimental study on a new radioactive probe for the treatment of lacrimal duct stenosis

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## Abstract

*Our aim* was to study the treatment effect of a radioactive probe on lacrimal duct stenosis. *We applied* experimentally in 30 inbred white rabbits a lacrimal duct stenosis model and the rabbits were randomly divided into 3 groups: the stenosis group, the surgery group and the radioactive probe group. We also separated a blank control group of 5 rabbits. Rabbits in the surgery group and the radioactive probe group were examined by digital subtraction angiography (DSA) 10min and 30d after treatment before being sacrificed. Rabbits in the stenosis group and the control group were examined by DSA 60min before they were sacrificed. Specimens of the lacrimal ducts at the stenosis site were collected immediately after the rabbits were sacrificed. Morphological changes were observed through haematoxyline-eosin staining, while lumen areas of lacrimal duct were observed through computer based photo analysis. *For the surgery and the radioactive probe group*, stenosis cure rates were 100% 10min after treatment. Thirty days after treatment, the rates of stenosis were 40% and 5% for the above groups, respectively. Morphological observations showed that each layer of the lacrimal duct wall in the stenosis group became thicker with higher proliferation of cells. Each layer of the lacrimal duct wall in the surgery group was thinner than in the stenosis group; however, the extent of cell proliferation was similar. In the radiation treatment group, the interstitial layers of the lacrimal duct epithelium, elastin and collagen fibers and other connective tissue components were thinner than in the surgery group. Cells proliferation was significantly weakened in the radiation treatment than in the stenosis and in the surgery groups. The average areas of lacrimal duct in the control, stenosis, surgery and the radioactive probe groups of the examined sites, were:  $0.84 \pm 0.28 \text{ mm}^2$ ,  $0.26 \pm 0.13 \text{ mm}^2$ ,  $0.55 \pm 0.31 \text{ mm}^2$  and  $0.80 \pm 0.36 \text{ mm}^2$ , respectively. *In conclusion*, the radioactive lacrimal duct probe showed distinct therapeutic effects in curing lacrimal duct stenosis and in preventing restenosis after the operation.

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