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EVIDENCE THAT THE HUMAN SOFT PALATE FORMS BY FUSION AND NOT MERGING

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Objectives: The human secondary palate is composed of the anterior hard and posterior soft palate, and forms between 6-12 weeks of gestation. There has been controversy as to whether palatal shelves in the soft palate join by fusion similar to the hard palate, or whether merging and proliferation of the mesenchyme at the posterior edge of the developing hard palate is the mechanism. The purpose of this study is to examine the mode of soft palate closure.

Methods: Serial sections of secondary palates from 13 human fetuses from 54-74 days of development post conception were stained, photographed and imported into WinSurf 3D software. Anatomical structures were traced including the palatal shelves, midline epithelial seam and palatine aponeurosis, the images aligned and then stacked to create a 3D representation.

Results: We analyzed the following numbers of specimens: 54 days-2; 57 days-4; 59 days -2; 64 days-1; 67 days-1; 70 days-2; 74 days-1. At 54 days, a midline seam is present in the anterior soft palate, but more posteriorly the soft palate is open. Between 57 and 59 days a thick midline seam is observed throughout. There is some variability between specimens, but by 74 days there was complete soft palate union with the presence of a continuous palatine aponeurosis. Overall, our sample included a total of 7 fetuses with a midline seam in the soft palate.

Conclusions: The formation of a bilayered epithelial seam followed by breakdown of the seam and mesenchymal fusion is the mode of soft palate formation in humans.