

cigarette smoking, anticonvulsants, steroids, and retinoids are associated with higher rates of oral clefting. Folate deficiency is also a risk factor for clefting.

Pathophysiology

Cleft deformities represent a defect in cell migration that results in a failure of the maxillary and premaxillary processes to come together between the fourth and tenth weeks of embryonic development. Although often appearing together, CL and CP are distinct malformations embryologically, occurring at different times during the developmental process. Merging of the primary palate (upper lip and alveolus bilaterally) is completed by the seventh week of gestation. Fusion of the secondary palate (hard and soft palate) takes place later, between the seventh and tenth weeks of gestation. In the process of migrating to a horizontal position, the palates are separated by the tongue for a short time. If there is delay in this movement or if the tongue fails to descend soon enough, the remainder of development proceeds, but the palate never fuses.

Diagnostic Evaluation

CL and CL/P are apparent at birth. CP is less obvious than CL and may not be detected immediately without a thorough assessment of the mouth. CP is identified through visual examination of the oral cavity or when the examiner places a gloved finger directly on the palate. Clefts of the hard and soft palate form a continuous opening between the mouth and the nasal cavity. The severity of the CP has an impact on feeding; the infant is unable to create suction in the oral cavity that is necessary for feeding. However, in most cases, the infant's ability to swallow is normal.

Prenatal diagnosis with fetal ultrasonography is not reliable until the soft tissues of the fetal face can be visualized at 13 to 14 weeks. About 20% to 30% of infants with CL and CL/P are prenatally diagnosed through ultrasonography ([Robbins, Damiano, Druschel, et al, 2010](#)), although infants with CP only are rarely diagnosed prenatally.

Therapeutic Management

Treatment of the child with CL and CP involves the cooperative