Role of TUI in evaluating palatine clefts: a novel diagnostic approach

S. Lakshmy; N. Rose; P. Masilamani; S. Umapathy; T. Ziyaulla Shri Lakshmi clinic and scan centre, Krishnagiri, India

Objectives: The objective of the study is to highlight the role of TUI in evaluating fetal palate at 11-14 week scan. Tomographic ultrasound imaging (TUI) is a technology that allows the examiner to obtain a volume data set that simultaneously displays multiple images at specific distances.

Unilateral cleft lip and cleft palate (CLCP): Defect (arrow) seen in the palatal line corresponding to the side of unilateral cleft

Bilateral CLP without involving secondary palate: The proximal portion (arrowhead) is formed by premaxillary protrusion and distal portion by the secondary palate (arrow)

Bilateral CLP involving secondary palate: Vomer bone in seen in midline (arrowhead) and complete absence of palatal line (arrows) in para sagittal sections.

Median CLP: Complete absence of the palatal line (arrows) in all sections.

Isolated CP: a) The vomer is seen in midsagittal section (arrowhead) and absence of palatal line (arrow) caudal to alveolar ridge in the parasagittal view b) Intact base of RNT in anterior section (arrowhead) and deficient base of the RNT (arrow) in posterior sections

Normal: (1) Sagittal view showing the intact palatal line (arrow) in all sections (2) Coronal view showing intact base of RNT (arrows) in all sections

Methods: Volume acquisition of the fetal face was done in midsagittal view after adequate magnification. All 3D datasets were obtained with a mechanical transducer using a 50 degree sweep, from one side of the face to the other using optimized ultrasound settings. The volume was rotated as shown in figure 1 and volume contrast imaging was applied. The appearance of palatal line in sagittal sections (Fig 1) and the base of the retronasal triangle (RNT) in coronal sections (Fig 2) serve as key landmarks in evaluating palatine clefts.

Results: Thirteen abnormal volumes have been studied with TUI and were confirmed postnatally. The type and extent of the cleft can clearly be defined using TUI. Though the palate is best visualised in axial view, but the abnormal landmarks in the sagittal view of the face at 11-14 weeks are easily recognisable.

Conclusion: The palate, being a small bone, is cumbersome to evaluate using 2D ultrasound. The potential advantage of TUI in evaluating palate is that it allows the display of numerous 2D slices from the given volume. Understanding sectional anatomy of the normal and abnormal palate with the help of TUI especially in sagittal plane serves as an effective tool to diagnose palatine clefts.

drlakshmiravi@gmail.com