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Regional ventilation using multi-plane and patient tailored EIT approach in an infant with cogenital regional hyperinflation

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E-Posters

EP-20: REGIONAL VENTILATION USING MUTI-PLANE AND PATIENT TAILORED EIT APPROACH IN AN INFANT WITH CONGENITAL REGIONAL HYPERINFLATION

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OBJECTIVES: To evaluate regional ventilation using a new textile EIT interface at different planes and a patient-tailored chest model in a term infant with a congenital hyperinflated left upper lung lobe.

METHODS: A previously well male term infant presented with progressive tachypnoea and oxygen requirement on Day 10 of life. Chest X-ray and high-resolution CT-scan showed a congenital hyperinflated left upper lobe with significant mediastinal shift of anatomic structures to the right. EIT recordings, using a new non-sticky textile electrode infant belt (Swisstom, Switzerland) were performed to compare regional dynamic volume behaviour with the anatomical CT. Scans were performed at three cross-sections (7th intercostal space, nipple and just below armpit) corresponding to different mediastinal shift and hyperinflation. Regional tidal ventilation was determined using a standard and a customized 3D thorax model derived from CT generating EIT images tailored directly to the infants chest shape and location of anatomical contents.

RESULTS: On all reconstructions, EIT was able to show the regional differences in ventilation consistent with the known pathology. The patient-tailored EIT images better accounted for mediastinal shift and provided more accurate assessment of the restricted right upper and left middle region ventilation expected from the hyperinflated lung lesion.

CONCLUSION: This case report shows that in complex pulmonary conditions, EIT is capable of visualizing regional redistribution of ventilation using a multi plane and an optimized chest shape approach.

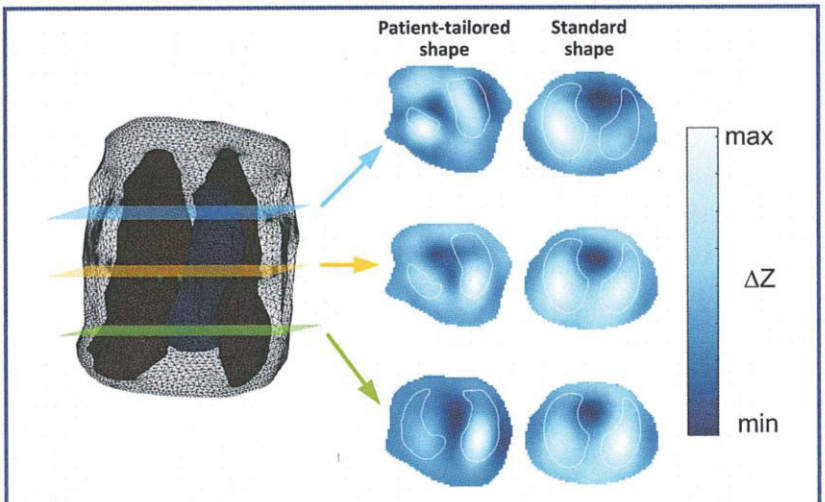

Figure. CT-derived 3D chest model with corresponding patient-tailored EIT images *(left)* and those generated by the standard approach *(right)*

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