



## AB060. 207. Digital reconstruction of human mesentery development

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**Background:** Anatomical planes provide the basis for oncologic surgery. Despite considerable surgical relevance, the development of the mesentery remains uncharacterized. This study aimed to generate a four-dimensional model of the mesentery during embryogenesis.

**Methods:** A novel methodological approach was developed. First, embryological specimens (n=10; Carnegie stages 13 to 23) were sectioned, stained and digitized. Regression analysis (SIFT; ImageJ2, v1.50e, NIH, US) stacked sections in their true alignment. Within aligned datasets, manual tracing highlighted areas of regional anatomy. An internal panel of two reviewers verified manual tracings. Advanced image analysis (Cinema4D; Maxon Computer GmbH,

Germany) generated a 4-dimensional, exploratory model of mesenteric and digestive system development.

**Results:** Shape interpolation produced a spatiotemporal model of mesenteric development from 4 to 8 weeks. Computer-rendered reconstructions enabled direct visualization of intestinal coiling, demonstrating that gut rotation does not occur. Three-dimensional reconstruction of fore-, mid- and hindgut regions of mesentery demonstrated that continuity between these regions persists into adulthood. Cadaveric dissection and comparison with foetal models confirmed developmental observations. Furthermore, cadaveric findings correlated with adult cross-sectional reconstructions.

**Conclusions:** These findings present a model of mesenteric development which differs considerably from classic descriptions. Persistence of continuity into adulthood provides a novel, anatomical route of disease spread. *En bloc* removal of the mesentery during cadaveric dissection confirms that the mesentery maintains all abdominal digestive organs in position and in continuity with other systems. Using such an approach, conditions regarded as previously inoperable (e.g., locally advanced pancreatic cancer) may become operable.

**Keywords:** Mesentery; peritoneum; embryology; morphology; development

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