

## Distribution of genes and their proteins in Ladd's band tissue

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**Objectives.** Ladd's bands belong to congenital intra-abdominal adhesions – they are fibrous ligaments that extend from the colon to the abdominal wall. The main cause is associated with abnormal intestinal rotation during the embryonic period, and these links can lead to small bowel obstruction. The expression of certain genes – CDX1, SHH, IHH might be associated with intestinal malrotation and contribute to the formation of Ladd's ligaments; thus, we aimed to detect these genes and their proteins.

**Materials and methods.** Specimens of 10 patients with Ladd's band obtained during the first adhesion removal surgery were analyzed. The material of 8 patients obtained during inguinal hernia surgery developed the controls. Gene (CDX1, IHH, SHH) expression was analyzed by in situ hybridization and their proteins – by immunohistochemistry. Positive cells were counted semi-quantitatively. The Spearman correlation coefficient was used to clarify the relationships between the factors.

**Results.** CDX1 protein appeared in an increased number of fibroblasts, in some macrophages, and decreased in endotheliocytes, mesotheliocytes of patients. The same gene appeared just in some fibroblasts. SHH protein showed an increased number of fibroblasts, endotheliocytes, mesotheliocytes and macrophages in patients, while the same gene was detected in an indistinct number of fibroblasts of adhesions. Finally, a similar number of IHH protein positive different cell types was detected in both – patients and controls. Some moderate correlations were observed between different cells of SHH and selectively between CDX1 endotheliocytes only.

**Conclusions.** SHH protein dominance in Ladd's bands moves this protein as significant in this adhesion type pathogenesis. An increase of fibroblasts and their rich expression for gene proteins underlines this type of cell for the development of embryonic adhesions. IHH seems not to be involved in the Ladd's bands formation. SHH and CDX1 gene proteins, but not the same genes, are players in the Ladd's bands formation.