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Delayed Wound Healing in Leukocyte Adhesion Deficiency Type 1

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Leukocyte adhesion deficiency type 1 (LAD-1) is an autosomal recessive immunodeficiency caused by mutations in the β2 integrin, CD18, and characterized by recurrent bacterial infections, impaired pus formation, and delayed wound healing. Recent studies of CD18 knockout mice have demonstrated that defective migration of neutrophils into wound sites causes a severe reduction of transforming growth factor-β1 secretion by monocytes, resulting in impaired myofibroblast differentiation and delayed wound healing. However, little is known about cellular events of wound healing in human LAD-1. Here, we described a 3-month-old boy affected with LAD-1 who showed the complete lack of CD18 and its associated molecules CD11b and CD11c on his granulocytes and monocytes. His immunological and sequencing data have been reported elsewhere. He showed delayed wound healing after surgical excision of an infected urachal cyst from the age of 2 months (Figure A). Similar to the findings of CD18 knockout mice, his wound specimens obtained from the surgical debridement revealed the absence of neutrophils and the presence of monocyte/macrophage infiltrates (Figure B, C). The infiltrating cells also included low numbers of plasma cells as well as lymphocytes, most of which were CD20+ B cells by immunohistochemical staining (Figure D). Although our patient showed somatic revertant mosaicism within the CD8+ T-cell subset, CD18+ cells were not detectable in the wound. These findings suggest that β2 integrin-independent mechanisms may play a role in transmigration of monocytes and B cells through vascular endothelium. In addition, like CD18 knockout mice, the local injection of recombinant transforming growth factor-β1 could be a potential therapy for delayed wound healing. Improved understanding of physiology of cutaneous wound healing in LAD-1 may lead to better therapeutic approach.
for LAD-1 patients with delayed wound healing.

**List of abbreviations:** Leukocyte adhesion deficiency type 1, LAD-1.
References


Figure Legend

Figure. Delayed wound healing that was located just below the umbilicus (A). Wound specimens were stained with May-Giemsa (B) or anti-CD68 antibody (C). The percentage of cells in wound specimens is shown (D).