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Comparison between cicatrization in weaning, adult and old rats with provoked incisional hernia

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ABSTRACT: *Background:* Incisional hernias occur with some frequency in adult population, however they are rare in children. It is hypothesized that the most efficient process of healing in pediatric population is the answer to this important difference in incidence. Therefore, certain elements of healing such as neovascularization, degree of inflammation, percentage of mature and immature collagen, proliferation of fibroblasts and expression of certain genes can explain why healing in children is more efficient when compared to the adult and elderly population. *Materials and methods:* Seventy-one rats of 3 different age groups (weaning, adult and old) underwent surgery in 3 different incisions (vertical, oblique and horizontal). In the procedure, skin and abdominal wall of the animal were sectioned and only skin was sutured, in order to mimic incisional hernia in the animals. After 4 weeks of surgery, the rats were sacrificed, their skin removed, and the extent of scar tissue formed in the muscle opening was measured. In addition, samples of scar tissue were collected and histological, immunohistochemical and molecular analyzes were performed. *Results:* Shorter length hernias were formed in weaning rats when compared to old ones in surgery with horizontal incision ($p=0.03$). There was greater proliferation of fibroblasts in rats of the younger age groups, regardless of the type of incision made. The Lox gene was more expressed in weaning-aged rats in vertical and oblique incision surgeries. *Conclusions:* The contraction of scar tissue formed in wounds appears to be more intense in horizontal cuts than vertical ones. The greater proliferation of fibroblasts in scar tissue of weaning rats may explain the better healing and lower incidence of hernias in pediatric population. The Lox gene seems to be more expressed in weaning groups and may also explain better healing in children, but more studies need to be done.

Keywords: Incisional hernia; Child; Wound healing; Rats; Collagen.