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RESEARCH ARTICLE

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## AVALIAÇÃO ESTÉTICA DE CICATRIZES SUBMETIDAS A DIFERENTES TEMPOS DE RETIRADAS DE PONTOS CIRÚRGICOS” for “AESTHETIC EVALUATION OF SCARS SBMITED TO DIFFERENT TIMES OF WITHDRAWAL FROM SURGICAL POINTS

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### ABSTRACT

O processo de cicatrização vem sendo estudado durante anos, a fim de encontrar alternativas auxiliar na repercussão deste processo. O uso de pontos cirúrgicos nas suturas de feridas cutâneas é amplamente utilizado, principalmente com pontos cirúrgicos simples. Com o tempo de retirada não estabelecido em literatura visando melhor estética, avaliou-se largura, comprimento e aparência das lesões com diferentes tempos de retirada desses pontos em ratos Wistar. Utilizando 25 ratos, machos, hípidos com peso entre 200-250g, submetidos a uma incisão de três centímetros e realizados quatro pontos simples. Os animais foram divididos em cinco subgrupos com cinco ratos cada diferenciando-se os tempos (em dias) de retirada: G1 aos 5, G2 aos 7, G3 aos 8, G4 aos 10 e G5 aos 14. A avaliação das feridas foi feita, semanalmente, do ponto de vista macroscópico utilizando-se a Escala de Cicatrização de Vancouver e paquímetro para medição de comprimento e largura.

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## INTRODUCTION

The history of Medicine has revealed a continuous dynamic in the knowledge in which techniques and treatments are created, improved, modified and abandoned, for a significant evolution of the propaedeutics linked to the patient. In Plastic Surgery, this dynamic is observed through the creative imagination of specialists in the field, which generates, through continued publications in books and magazines, the great anxiety and concern to raise the quality of results, their conservation in the long term and the reproduction of effects among surgeons (SALLES *et al.*, 2011). Thus, in the 19th century, there was a great development of the two major strands of Plastic Surgery: Aesthetic Surgery and Reparative Surgery. The great wars of the last century, the increase in machines and their accidents, as well as man's interest in the resolution of birth defects allowed the advancement of restorative surgery. At the same time, the search for more harmonious aesthetic results and rejuvenated bodies was the reason for the development of the aesthetic bias. Currently, anatomical results are sought in reconstruction and, in aesthetic improvement, the maintenance of function. Therefore, the aesthetic importance of scars comes from the importance of leaving imperceptible surgical repairs, without developing any functional or structural changes (FERREIRA, 2006).

Santos and Oliveira (2012) described the withdrawal time from 12 to 15 days after hospital discharge. Bae and Bae (2014), on the other hand, recommended removal on the seventh postoperative day, with conditions to assess local and systemic conditions, individualizing this time. Still, Bravini *et al.* (2015) instructed the removal of simple and separate stitches between the 6th to the 7th postoperative day, considering the 4th day for sutures done without tension and following the lines of force of the skin. However, no data were found to specify the best removal time, combined with the aesthetic and functional characteristics of the scar. Through this, it is considered whether it is possible to achieve aesthetic benefits with the same resources used in surgical practice, changing only the duration of the stitches on the wounds. Thus, it is worth checking the different permanence times of these sutures, influencing the final healing aspect. Thus, only changes in instructions to remove the stitches would be possible to modify the scar.

## METHODOLOGY

The present study was carried out using rats from the vivarium of the University Center of Patos de Minas - UNIPAM, Patos de Minas, MG.

It has a two-aisle system (clean and dirty) between the experimentation rooms with a defined flow of people and supplies and is protected with sanitary barriers (barrier autoclave, air filtration system, pressure differential, air-lock, etc.). The room temperature is controlled at 22°C. It has a system of insufflation, exhaustion and filtration of the air in the rooms, preventing the dispersion of ammonia in the environment, performing 15 to 20 air changes / h and the light cycle is defined 12 hours of light and 12 hours of dark. The animals were placed in mini isolators, containing one mouse each, attached to a ventilated rack. Food and water were provided ad libitum. The bed was made of pine wood shavings. The entire system is connected to a generator, which guarantees maintenance in the event of a power outage. The project was carried out after CEUA approval. Twenty-five healthy male rats were used at 45 days of age, weighing between 200 and 250 grams. After a period of adaptation of the animal with the researcher, manual restraint was performed, by digitally grasping the dorsal region, for the application of dissociative injectable anesthesia, using the combination of midazolam at a dose of 2mg / kg, xylazine hydrochloride at a dose of 10mg / kg and ketamine hydrochloride at a dose of 70mg / kg, all intraperitoneally (IP); in addition to the use of analgesia with tramadol, using 8mg / kg subcutaneously (SC). Then, the animals were placed in the supine position and trichotomy was performed on the upper dorsal region of the animal. Subsequently, surgical field antisepsis was performed with 0.2% povidone iodine. After anesthesia and animal preparation, the rats were submitted to an incision of approximately three centimeters, with closure by first intention with four simple points, using 3-0 nylon thread. The animals were then divided into five groups composed of five animals each, differentiating themselves by the time of removal of the surgical points, being: G1 - at five days, G2 - at seven days, G3 - at eight days, G4 - at ten days, and the G5 - at 14 days.

Immediately after the suture, the wound was measured using a caliper and visual observation for the study design and subsequent comparison. After surgery, all animals were reevaluated weekly and the time for removing the stitches respected according to the methodology described. The removal was performed using manual containment of the animal, with traction of the wire and cutting it with a scalpel blade, without the need for anesthesia. All the material used was sterile. After weekly evaluation for 12 weeks, using a caliper to measure length and width, and using the Vancouver Healing Scale through macroscopic visualization and photography, the animals, under anesthesia, were placed in a 5L CO2 camera / min for 10 minutes to perform euthanasia. Relative and absolute descriptive statistical analysis was performed on the variables evaluated.

## DISCUSSION

Regarding the macroscopic evaluation performed using the Vancouver Scar Scale (VSS), a pattern was noticed among all the scars assessed weekly. Thus, a gradual reduction in the score was observed, and the criterion of local coat distribution was also evaluated (VÍTOR, 2015). In the immediate postoperative period, the scar is characterized by vascularization as red (2), pigmentation as normal (0), elasticity in bands (4) and height between 2-5mm (2), punctuating thus 8 in VSS. On the 5th postoperative day, it was reassessed, scoring 6 in VSS as red (2), normal (0), firm (3) and height <2mm (1). On the 7th postoperative day, a pink (1), hypopigmented (1), deformable (2) and flat (0) scar was discerned as 4 points in the VSS. On the 14th postoperative day, a scar with a VSS value of 2 is seen, being normal (0), hypopigmented (1), flexible (1) and flat (0). These characteristics remained until the 8th week, when they evolved to characterize normal vascularization, pigmentation and elasticity, and a flat surface, scoring 0 in VSS. The measurements made were cataloged for later statistical evaluation, in order to glimpse possible variations. While they were being performed, the classic tendency to reduce and contract the wounds was noticed, as the scar matured (MARQUES, 2014). After all measurements, the Shapiro-Wilk test was chosen in order to investigate whether the data

adhere to the normal distribution curve and, therefore, to verify whether it is recommended that the data be statistically treated using an Analysis of Variance (ANOVA). Thus, the lesion length of the G4 mice did not adhere to the normal distribution curve, as did the lesion width of the G1 and G3 mice during the 12 weeks of evaluation.

**Table 1. Shapiro-Wilk test for analysis "Comprimento" for "length" and "Largura" for "width"**

Grupo	Idades [dias]	p normal
1	5	0,417
2	7	0,663
3	8	0,502
4	10	0,042
5	14	0,892

**Table 2. Shapiro-Wilk test for analysis "Largura A"**

Grupo	Idades [dias]	p normal
1	5	0,004
2	7	0,073
3	8	0,042
4	10	0,403
5	14	0,094

**Table 3. Shapiro-Wilk test for analysis "Comprimento B"**

Semana	p normal
1	0,219
2	0,608
3	0,853
4	0,497
5	0,436
6	0,304
7	0,945
8	0,271
9	0,384
10	0,092
11	0,947
12	0,736

**Table 4. Shapiro-Wilk test for analysis "Largura B"**

Semana	p normal
1	0,024
2	0,140
3	0,313
4	0,704
5	0,900
6	0,392
7	0,000
8	0,043
9	0,149
10	0,005
11	0,269
12	0,102

The groups that passed the Shapiro-Wilk test were submitted to the One-Way ANOVA test, which performs the comparison between the different groups in the same analysis to assess whether there is a statistically significant difference between the groups analyzed, considering a 95% reliability. The statistically significant difference between them was only seen during the weeks, with a significant decrease in length and width, regardless of the groups.

**Table 5 – One-Way ANOVA for "Comprimento A"**

Grupo	Idades [dias]	p normal
1	5	3,94E-12
2	7	7,06E-07
3	8	1,05E-10
5	14	4,39E-09

Table 6. One-Way ANOVA for “Largura A”

Grupo	Idades [dias]	p normal
2	7	2,75E-06
4	10	1,93E-03
5	14	4,51E-04

Tabela 7. One-Way ANOVA for “Comprimento B”

Semana	p normal
1	0,319900
2	0,014370
3	0,000754
4	0,011660
5	0,006323
6	0,000351
7	0,000000
8	0,005063
9	0,002956
10	0,065070
11	0,008912
12	0,008912

Tabela 8. One-Way ANOVA for “Largura B”

Semana	p normal
2	0,153
3	0,629
4	0,491
5	0,811
6	0,015
8	0,424
9	0,532
10	0,736
11	0,055
12	0,397

Still, the results that passed the One-Way ANOVA test were subjected to the Turkey's pairwise test, in order to ascertain which groups present a statistically significant difference, and it was noticed that in all the withdrawal times there was a gradual reduction of the lesion, in length and width, depending on the initial incision made. Considering G1, whose stitches were removed five days after the procedure, from the 1st to the 6th week there was no noticeable reduction in the length of the cut, however the subsequent weeks, mainly from the 9th to the 12th week, showed an important reduction in length. There were no significant changes in the width of the lesion. G2, on the other hand, did not obtain a noticeable and consistent reduction in length in the first eight weeks, but this character changed, intensifying in the contraction of the lesion after the 10th week. Regarding the width, he presented from the 2nd to the 12th week a decrease in the wound. In G3, with stitches removed at eight days, the length of the wound decreased since the 4th week, with intensification at the 11th week. The width results were not conclusive for this group. Considering G4, the group whose stitches were removed 10 days after the procedure, there was a decrease in the length of the cut between the 5th and 12th weeks and a decrease in the width of the cut at the 11th and 12th weeks. Finally, in G5, there was a reduction in the length of the cut since the 4th week, intensifying from the 8th week, for this group. The width was gradually reduced, starting from the second week. For the other analyzes, although the data showed statistically significant differences, no consistent patterns were observed for wound healing.

## CONCLUSION

Thus, it was observed that there was no significant difference between the different withdrawal times, since after the second week, all scars had a gradual reduction depending on the size of the primary lesion. In addition, after the scar matured, there were no changes in visual aesthetics or related to size and width.

Further studies are suggested with a more detailed assessment of the size of the wounds and on a larger scale, aiming at a microscopic evaluation of these lesions, with anesthetized animals. In this way, it could differentiate aspects related to the movement of animals while assessing the measurement. A possible evaluation is also possible with different types of threads or even different thicknesses, in order to analyze the integumentary behavior generated by these changes.

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