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Comparative Techniques Between Electric Chauter and Smart Clamp Circumcision

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***Abstract*—**This research was conducted to compare the Circumcision techniques; the Electric Chauter and Smart Klamp. Circumcision is the act of cutting or removing part or all of the front cover skin from the penis. This action is a minor surgical procedure that is most often performed throughout the world, especially in men. This study took an investigation process of two different techniques of 60 patients in Klinik Super Sehat Medan of North Sumatra. Data obtained revealed that the patients with the Electric Chauter from first, second, third and the fourth day observation indicated the healing ratio reduction began from 5.23 to 1.63. On the other hand, Smart Klamp showed the reduction of healing ratio started from 4.73 to 2.44. It noted that healing process was almost similar, no significant difference. The obtained values of two distinguished techniques from day 1 to day 4 only ranged from 0.05 to 0.19. It concluded that t test value >0, 05. Clinics may prefer one of the two techniques Circuses; because there is no significant different between them

Keywords- *Electric Chauter, Smart Klamp; circumcision*

I. INTRODUCTION

Circumcision is a religious and traditional ritual in some cultures and involves the removal of the preputium penis. It may be performed by a variety of techniques, and although it is regarded as a relatively safe procedure, it does, like any surgical procedure, carry the risk of complications [1]. This procedure is the most minor surgical procedure performed worldwide, especially in men. Medically circumcision is performed to maintain sexual health and prevent sexually transmitted diseases [2]. The World Health Organization (WHO) 2018 [3] notes that around the world 30% of men aged 15 years and over have circumcised, of which two-thirds (69%) are Muslim, 0.8% are Jewish, and 13% are non-Muslim and Jewish on the grounds "health". Circumcision is needed to treat chronic bleeding in the penis, and penile cancer, and many diseases that can be avoided by circumcision, such as phimosis, paraphimosis, candidacies, malignant tumors and praganas in the genital area of men, men who are circumcised more hygienist, in old age and proven to be rare contracting infection through sexual contact. Circumcision reduces the bacteria that can live under the foreskin. This include bacteria that can cause urinary trct infections or, in adults, Sexually Transmitted Infections (STIs). Some research shows that circumcision may decrease the risk of a man getting Human Immunodeficiency Virus (HIV) from an infected female partner [4].

Indonesia is an eastern country where the majority of the population is Muslim. The preferred age for a son's circumcision ranged from newborn to 34 years, with a mean of 15 years. The most frequently expressed reason was to reduce the risk of STIs [5]. Circumcision is usually the first serious sexual health issue to be faced by boys or men. In Indonesia virtually all Muslim men are circumcised, a procedure called

Sunatan [6]. The number of boys who have circumcised in Indonesia is 85% (8.7 million). Of this number 25% (2.5 million) are non-Muslims. Circumcision is indeed not a procedure that is carried out without the possibility of side effects. Around 20-30 of 1,000 children who are circumcised experience complications in the form of heavy bleeding or infection at the suture site. As many as 10 out of 1,000 children even have to be re-circumcised because there is still too much skin left. The risk faced by male circumcision is generally low, but can have serious consequences if circumcision is performed in an unhygienic place and performed by unskilled service providers, or with inadequate equipment. In addition, many methods have been developed in the implementation of circumcision so that the circumcision process becomes safer, easier, faster and painless [7].

There are various methods of circumcision, such as the Electric Chauter Method and SmartClamp Method. Both of these procedures remove the preputium with excellent cosmetic results. Circumcision with Smart Clamp (SC) is efficient and safe and could change the classical approach to circumcision [8]. Clamp adopts the use of device to effect circumcision obviating the use of knife in majority of cases. The device method is the commonly used method of circumcision in recent practice [9].

From the data carried out in the Gambangan village, Maesan sub-district, there were 134 children who were circumcised during the 2013 period. The frequency of circumcision depends on geographical location, religion, and economic level. In one study, there were also differences in circumcision rates among racial and ethnic groups: 81% in whites, 65% African-Americans, 54% in Hispanics. According to a survey from Neonatal Hospital Discharge [10], 1.2 million (65.3%) infants were circumcised. At present, only a few do circumcision, 70% of obstetricians, 60% of family doctors and 30% of pediatricians. There are so many benefits that can be taken from this action such as reducing the risk of sexually transmitted diseases, penile cancer, and urinary tract infections. In observational studies found that men who are not circumcised have a risk of urinary tract infection. Evidently circumcised male penis is more hygienic [11].

II. RESEARCH METHOD

This type of research is analytic observation research, with case control design. Case control is a study conducted by comparing between two groups, namely the case group and the control group. Case‐Control study design is a type of observational study design. In an observational study, the investigator does not alter the exposure status. The investigator measures the exposure and outcome in study participants, and studies their association [12]. The case-control design was originally developed to support prospective studies in situations where data on subjects were costly to acquire, and study budgets did not allow for recruiting and following large cohorts. However, its application in retrospective database studies, for example those using electronic health records and insurance claims where longitudinal person-level data have already been captured and the analysis is performed solely within the resident data, has become commonplace [13]. Case control studies are carried out by identifying case groups and control groups, then retrospectively examining risk factors that might explain whether cases and controls may be exposed to exposure or not. This study aims to determine the differences in the effectiveness of Electric Chauter circumcision and Smart Clamp circumcision wounds to the wound healing process at the Klinik Super Sehat Medan.

2.1. Population

Population is the overall source of data needed in a study. The case population in this study was all patients who had circumcision and were enrolled at the Klinik Super Sehat Medan with a total of 150 visits in 2019. The sample is part of the population selected in a certain way so that it is considered to be able to represent the population. The determination of the sample size was determined based on the Slovin formula.

In the Slovin formula the number of respondents taken was 60 patients, the study was divided into groups of A as many as 30 patients who were subjects of circumcision with Chauter patients and group B of 30 circumcision patients with the smart clamp method.

2.2. Types and Data Collection Methods

The type of data used in this study is the type of primary data that is data obtained directly by researchers looking directly at the response by using a wound observation sheet (beat jhonson wound ssmentoll) at the Klinik Super Sehat Medan. The method of data collection is done after applying for a preliminary survey and research permit to the Ministry of Health field of health polytechnic education majoring in nursing. Then take care of a research permit from the department of nursing majoring D-IV Study Program at the Klinik Super Sehat Medan research site. After obtaining permission, data collection is carried out. Researchers look for respondents according to criteria that have been made previously. If the researcher has found a prospective respondent, the researcher explains the purpose and benefits of this study then the prospective respondent who is willing to sign an informed consent to participate in the research carried out.

III. DATA ANALYSIS

3.1. Univariate Analysis

This research aims to explain or describe the characteristics of each research variable. The form of univariate analysis depends on the type of data [14]. For numerical data the mean or average, median or standard deviation is used. In general, this analysis only produces the frequency distribution and percentage of each variable, for example the frequency distribution and percentage of each variable. For example the frequency distribution of respondents based on age, gender, education level, and so on. Data were analyzed descriptively by describing the frequency distribution of the mean, median, mode of each variable then a conclusion can be drawn.

3.2. Bivariate Analysis

There are varieties of bivariate statistical inference methods such as Student's t-test, Mann-Whitney U test and Chi-square test, for normal, skews and categorical data, respectively [15]. T test is used to test the comparative hypothesis (difference test). Independent Sample t test Different test is used to find out whether or not there are differences in the average of the two groups that are not related (independent) to one another, with the aim of whether the two groups have the same average or not significantly, assuming data normally distributed with a small number of samples (30 or less than 30). With this study, different test of Independent Sample t Test 30 was used to test different mean significant of 2 sample groups which is not related, with level of confidence 95% or $\alpha = 0{,}05$.

IV. RESEARCH RESULT

4.1. Univariate Analysis

Table 1 The Frequency Distribution of the Process of Healing Circumcision with Electric Chauters and Smart Clamp Circumcision in the Klinik Super Sehat Medan

Wound Healing Process	Electric Cauter			Smart Clamp		
	Category	**f**	**%**	**Category**	**f**	**%**
1st Day	Regeneration	0	0	Regeneration	0	0
	Degeneration	30	100.0	Degeneration	30	100.0
	Total	**30**	**100.0**	**Total**	**30**	**100.0**
3rd Day	Regeneration	24	80.0	Regeneration	27	90.0
	Degeneration	6	20.0	Degeneration	3	10.0
	Total	**30**	**100.0**	**Total**	**30**	**100.0**
7th Day	Regeneration	30	100.0	Regeneration	30	100.0
	Degeneration	0	0	Degeneration	0	0
	Total	**30**	**100.0**	**Total**	**30**	**100.0**

In Table 4.1 we can know the process of caution for electric circumcision chauter on the first day known to all respondents experiencing a degeneration wound process (100%). On the third day, 24 respondents (80%) experienced a wound regeneration process and 6 respondents (20%) experienced a degeneration wound process. On the seventh day all respondents experienced a process of wound regeneration (100%). The smart Clamp wound healing process on day I was known to all respondents experiencing a degeneration wound process (100%). On the third day, 27 respondents (90%) experienced a wound regeneration process and 3 respondents (10%) experienced a degeneration wound process. On the seventh day all respondents experienced a process of wound regeneration (100%).

4.2. Bivariate Analysis

After the wound healing process data in circumcision patients is obtained before the Paired Sample T-Test is performed, then the Kolmogorov Smirnov normality test is carried out. The following results of data normality test can be seen in table 4.2. below this.

Table 2 Data Normality Test Results for Wound Healing Processes in Patients in the Chauter Electric Circumcision Group and Smart Clamp Circumcision Group on Days 1st, 3rd and 7th at the Klinik Super Sehat Medan

Day	**Chauter Electric Circumcision**		**Smart Clamp Circumcision**	
	p-value	**Information**	**p-value**	**Information**
1st	0.429	Normal	0.260	Normal
3rd	0.296	Normal	0.080	Normal
7th	0.356	Normal	0.213	Normal

The results of the Kolmogorov Smirnov data normality test in Table 4.2 show that all data healing processes of wounds day 1st, 3rd and 7th are normally distributed because all p-values are greater than 0.05. So that it can be done for the next test, namely paired sample t-test.

Table 3The Effectiveness of Chauter Electric Circumcision to Wound Healing Process at Klinik Super Sehat Medan in 2019

Day	**Healing Process**	$\bar{x}$	**SD**	**Difference**	**Lower**	**Upper**	***p-value***

1st – 3rd	I	19.23	1.13	5.23	4.15	6.31	0.000
	III	14.00	2.39				
3rd – 7th	III	14.00	2.39	1.63	1.10	2.16	0.000
	VII	12.37	1.15				

Based on table 4.3 it can be concluded that the average wound healing process with chauter electric circumcision from days I, III and VII decreased. It can be seen that the difference in the average wound healing process is getting smaller, namely from 5.23 to 1.63. From the results of the Paired Samples Test, the probability (p) obtained from days I, III and VII is 0.000; 0,000; <0.05. This means that there are differences in the average wound healing process from day to day. This means that the process of healing circumcision with electric chauter at the Klinik Super Sehat Medan is effective in accelerating the wound healing process.

Table 4The Effectiveness of Clamp Smart Circumcision to Wound Healing Process at Klinik Super Sehat Medan in 2019

Day	Healing Process	$\bar{x}$	SD	Difference	Lower	Upper	*p-value*
1st – 3rd	I	19.73	1.65	4.73	4.73	7.72	0.000
	III	15.00	1.96				
3rd – 7th	III	15.00	1.96	2.44	0.57	3.29	0.000
	VII	12.56	1.39				

Based on table 4.4 it can be concluded that the average wound healing process by circumcision Clamp Smart from days I, III and VII decreased. It can be seen that the difference among the wound healing processes is getting smaller, from 4.73 to 2.44. From the results of the Paired Samples Test, the probability (p) obtained from days I, III and VII is 0.000; 0,000; < 0.05. This means that there are differences in the average wound healing process from day to day. This means that the process of healing circumcision with a Clamp Smart at Klinik Super Sehat Medan is effective in accelerating the wound healing process.

Table 5 The Difference of Effectiveness between Electric Chauter Circumcision and Clamp Smart Circumcision to the Wound Healing Process at Klinik Super Sehat Medan in 2019

	Mean		Difference	n	p-Value
	Electrict Chauter Circumcision	Clamp Smart Circumcision			
1st day	19.23	19.73	0.50	30	0.178
3rd day	14.00	15.00	1.00	30	0.082
7th day	12.37	12.56	0.19	30	0.367

Based on table 4.5 above it can be seen that there are differences in the average days I, III and VII wound healing process with Electric Cauter circumcision and Clamp smart circumcision. Based on the t-independence test, the probability (p) obtained from days I, III and VII is 0.178; 0.082; 0.367; > 0.05. This means that there is no significant difference in the average wound healing process with Chauter electric and clamp smart circumcision.

V. DISCUSSION

5.1. Effectiveness of Electric Chauter Circumcision and Smart Clamp Circumcision Against the Wound Healing Process in Medan's Super Healthy Clinic in 2019

Based on the results of the study in table 4.3 it can be concluded that the average wound healing process with Chauter electric circumcision from days I, III and VII decreased. It can be seen that the average

difference in the wound healing process is getting smaller, from 5.23 to 1.63. From the results of the Paired Samples Test, the probability (p) obtained from days I, III and VII is (p) Value 0.000; <0.05. This means that there are differences in the average wound healing process from day to day. This means that the process of healing circumcision with Chauter electric at the Klinik Super Sehat Medan is effective in accelerating the wound healing process.

Based on table 4.4 it can be concluded that the average wound healing process with Clamp smart circumcision from days I, III and VII decreased. It can be seen that the difference in the average wound healing process is getting smaller that is from 4.73 to 2.44. From the results of the Paired Samples Test, the probability (p) obtained from days I, III and VII is 0.000; 0,000; <0.05. This means that there are differences in the average wound healing process from day to day. This means that the process of healing circumcision with a Clamp smart at the Klinik Super Sehat is Medan effective in accelerating the wound healing process.

From the above results it can be concluded that the process of healing circumcision with Chauter electric and Clamp smart are equally effective to accelerate the wound healing process. Wound care using 0.9% NaCl and gentamicyn ointment aims to clean the wound. By maintaining the humidity environment around the wound becomes more conducive, this will increase the process of granulation, proliferation, and maturation. And also can minimize the risk of infection. From the research that has been obtained above that the treatment of circumcision wounds by using this material was still quite effective, this is evidenced by the process of healing the wound quite well and did not experience infection. Wounds produced by circumcision type Chauter electric different from burns in general in terms of the extent of the burn. In Chauter electric circumcision wounds is performed by heating techniques so that the surface area of the burn is very minimal and this greatly affects the wound healing process.

5.2. The Difference of Effectiveness between of Chauter Electric Circumcision and Clamp Smart Circumcision to the Process of Healing Wounds at the Klinik Super Sehat Medan in 2019

Based on table 4.5 above it can be seen that there are differences in the average days I, III and VII wound healing process with Chauter electric circumcision and Clamp smart circumcision. Based on the t-independence test, the probability (p) obtained from days I, III and VII is 0.178; 0.082; 0.367; > 0.05. This means that there is no significant difference in the average wound healing process between Chauter electric circumcision and Clamp smart circumcision. Electric Chauter technique in our society is often also called laser or popular with laser circumcision when it is not, because it does not use laser energy and only uses heat energy from high frequency electric currents. Some medical personnel also often refer to it as electro Chauter (EC). Based on the type of electrodes used the electro cauter method has 2 types, namely monopolar and unipolar.

In the treatment of electric Chauter circumcision, the effect of electric heat cauter radiation on the mucosal tissue of the prepuce of the penis is able to minimize the occurrence of edema, so that the pain that arises is also more minimal and the child can do his daily activities better so that the wound healing process will be better. The smart Clamp circumcision method is a special plastic tube that varies in size according to penis size. The Clamp method has a large variety of tools and names, although the principles and methods are the same: The skin of the penis (foreskin) is clamped with a disposable device, then cut with a scalpel, without stitching. After that, the clamp will be placed on the penis until the wound dries for about 3-6 days.

VI. CONCLUSION

From the results of research on the difference of effectiveness between electric Chauter circumcision and smart Clamp circumcision on the wound healing process at the Klinik Super Sehat Medan in 2019, the conclusion can be found, namely:

1. The process of healing caution for electric Chauter circumcision can be concluded that the average wound healing process with electric Chauter circumcision from days I, III and VII decreased. It can be seen that the average difference in the wound healing process is getting smaller, from 5.23 to 1.63.
2. The smart Clamp wound healing process can be concluded that the average wound healing process with smart Clamp circumcision from days I, III and VII decreased. It can be seen that the difference in the average wound healing process is getting smaller that is from 4.73 to 2.44.
3. There is no significant difference in the average wound healing process between electric Chauter circumcision and smart Clamp circumcision. Average difference with values from day I, 0.50 to III, 1.00 and VII, 0.19 and based on the t test independent values> 0.05.

REFERENCES

[1] Uzun, G. Ozdemir, Y. Eroglu, M. Mutluoglu, M. 2012. Electrocautery-induced gangrene of the glans penis in a child following circumcision. BMJ Case Reports; doi:10.1136/bcr-2012-007096

[2] Canadian Paediatric Society. Circumcision of baby boys: Information for parents. 2019. https://www.caringforkids.cps.ca/handouts/circumcision

[3] World Health Organization. 2018. WHO guidelines on the management of health complications from female genital mutilation. Available at: http://www.who.int/reproductivehealth/topics/fgm/management-health-complications-fgm/en/. Accessed September 1, 2019.

[4] Xi RC, Sheng YR, Chen WH, et al. 2014. Male circumcision performed with 8-figure non-absorbable suture technique. Can Urol Assoc J. 8:e142-7. http://dx.doi.org/10.5489/cuaj.1521

[5] Morris, BJ. Hankins, CA. Lumbers, ER. Mindel, A. Klausner, JD. Krieger, JN. Cox, G. 2019. Sex and Male Circumcision: Women's Preferences Across Different Cultures and Countries: A Systematic Review. Elsevier Inc. on behalf of the International Society for Sexual Medicine. (http://creativecommons.org/licenses/by-nc-nd/4.0/).

[6] Hull, TH. Budiharsana, M. 2001. Male Circumcision and Penis Enhancement in Southeast Asia: Matters of Pain and Pleasure. Reproductive Health Matters; 9(18): 60-67.

[7] Rashid A, Iguchi Y. 2019. Female genital cutting in Malaysia: a mixedmethods study. BMJ Open; 9:e025078. doi:10.1136/bmjopen-2018-025078

[8] Karadag, MA. Kursat, MD. Demir, A. Kivrak, Y. Bagcioglu, M. Kocaaslan, R. Ari, M. Altunrende, F. 2015. SmartClamp circumcision versus conventional dissection technique in terms of parental anxiety and outcomes: A prospective clinical study. Can Urol Assoc J. 9(1-2):E10-3. http://dx.doi.org/10.5489/cuaj.2131

[9] Ahmed, AA. Mungadi, IA. 2013. Techniques of Male Circumcision. Journal of Surgical Technique and Case Report. 5(1): 1-7

[10] Touch, SM. Greenspan, JS. Kornhauser, MS. O'Connor, JP. Nash, DB. Spitzer AR. 2001. The Timing of Neonatal Discharge: An Example of Unwarranted Variation?. PEDIATRICS. 107(1):73-78

[11] UNAIDS. Neonatal and child male circumcision: a global review. UNAIDS. 2010. Avenue Appia, CH-1211 Geneva 27, Switzerland.

[12] Setia MS. 2016. Methodology series module 2: Casecontrol studies. Indian J Dermatol, 61 :146-51.

[13] Schuemie, M.J. et al. 2019. A plea to stop using the case-control design in retrospective database studies. Statistics in Medicine. 1–10.

[14] Denis, D.J. 2016. Applied Univariate, Bivariate, and Multivariate Statistics. Journal of Statistical Software. 72 (2) doi:10.18637/jss.v072.b02

[15] Zhang Z. 2016. Univariate description and bivariate statistical inference: the first step delving into data. Ann Transl Med 4(5):91. doi: 10.21037/atm.2016.02.11