Research Article

Evaluation of Successful Vasovasostomy with the two-layer Macroscopic procedure in Shahid Beheshti Hospital, Babol 2011-2015

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ABSTRACT

Introduction: Two layer macroscopic vasovasostomy is more economical and also less time-consuming regarding the operation time in comparison to microsurgical vasovasostomy. According to the previous studies it showed acceptable results. So we conducted this research to evaluate standard two layer macroscopic vasovasostomy in this study.

Methods: This cross sectional study has been conducted on 22 cases who were candidate for two layer macroscopic vasovasostomy. Patients were referred in shahid beheshti hospital from 2011 to 2015. Information collected with questionnaire and analyzed by SPSS v.22.

Results: Mean age of patients was 42.77±6.03 and mean time of operation was 64.32±4.43 minutes. Reason of further reversal in 1 case (%4.5) was change in mind, 18 cases (%81.8) remarriaged, and 3 cases (%13.6) lost their child. Estimated patency was %90/0. Pregnancy rate in who tried for pregnancy was %31.25. In the group with successful pregnancy mean age of wives were 34.8 year and in failed group it was 38 year (p=0.221). Vasectomy to vasovasostomy interval year in the group with successful pregnancy were 2.40±0.89 and in the failed group were 9.09±5.01 (p=0.009).

Conclusion: Period of time for operation was the same as the standard. Mostly, reasons of further vasectomy were remarriage. Patency rate almost was same as other studies and was satisfactory. This study showed that the interval between vasectomy and vasovasostomy has a critical role in successful pregnancy rate.

Keywords: Vasovasostomy, Macroscopic, Vasectomy, Patency, Pregnancy, Smoking.

INTRODUCTION

Vasectomy refers to an ambulatory surgery in which the sperm duct or vas deferens ligates in order to prevent fertility; Vasectomy reversal refers to a surgery in which fertility is restored by reconnecting the two cut ends of the vas deferens to each other or connecting vas deferens to epididymis; this surgery can be done in different macrosurgical and microsurgical tuboplasty procedures [1]. Mr. Cooper (1823) made the first vasectomy on an animal model (dog) and Harrison made the first vasectomy for the treatment of benign prostatic hyperplasia on humans. Then vasectomy as a contraceptive procedure from pregnancy became epidemic and now 354000-175000 vasectomy takes place each year in the United States of America [2]. 6 % of men who undergo vasectomy ask vasectomy reversal due to a variety of reasons including the death of a child, death of a spouse, divorce, and change in opinion [3]. About 4/7% of infertility in men with obstruction of the vas deferens are due to the reasons such as trauma, sexually transmitted diseases and congenital disorders, so that most of them are a good candidate for Vasovasostomy[4]. In 1919, William Queen Bee

reported the first successful Vasovasostomy in human and the macroscopic Vasovasostomy was progressed during the 20th century [5]. In 1977, Silber and Owen introduced Vasovasostomy with microscope simultaneously and separately [6][7]. However surgery with microsurgery procedure has had slightly better results, macroscopic Vasovasostomy using loupe magnification has this advantage to reduce the surgery costs and time, required for less skill level[8][9]. At common macroscopic procedure, the patient's recovery time will be much faster, the surgery cost will be less, the fertility will be acceptable and speed of action will be higher and the need to the surgery technique will be less. However, due to better results from the standard procedure, Vasovasostomy refers to multilayered microscopic procedure in which there is not the possibility for multi-layer anastomosis with macroscopic techniques due to smaller diameter of vas deferens[6][8]. Thus in this study a procedure has been introduced and examined that anastomosis of the vas deferens has been made via two-layer macroscopic technique.

MATERIALS AND METHODS

The present research as a retrospective cross-sectional study has been conducted on Vasectomy patients who were admitted to Shahid Beheshti hospital during 2011-2015. The statistical population consists of Vasectomy patients who intended to vasectomy reversal. The sample group consists of 22 patients via census method. Inclusion criteria included patient's bilateral Vasovasostomy, access to patient and his examination during and end of the study, getting permission to check patient and completeness of records. The exclusion criteria included unilateral Vasovasostomy, with or without Vasoepdidimostomy. After obtaining informed consent from patients, information was filled via questionnaire and checklist. Patients' demographic data such as age, marital status, age of spouse, number of children, the gap between vasectomy and Vasovasostomy, and history of smoking were obtained from the records and recorded. All other records including pregnancy time, sperm analysis

results, the presence of motile sperm at one semen samples after the surgery and post-operative complications (pain, swelling, bruising, symptoms related to anesthesia, infection, testicular atrophy and damage to the artery) were recorded. To examine the pain in patient, visual analog scale (VAS) was used [10]. Follow-up of results from patients' treatment at intervals of 4-6 weeks and one year after surgery were evaluated during repeated visits and phone calls. The presence of spermatozoa in sperm analysis means the technical success of the procedure. The couples' follow-up in terms of success at pregnancy was made during 6-12 months and the researcher started taking sample by proposing the written introduction letter from the University of Medical Sciences and introducing to the head of health centers and getting permission. In surgery procedure, the patients underwent spinal anesthesia at supine position and the surgery took last 50 to 90 minutes. The area of previous ligation of vas deferens at each side was opened by incision 5 to 10 mm on the scrotal skin, then previous node was removed and two sides of the vas deferens were cut and it was ensured by means of the pink Angiocatheter no. 18 to ensure about patency of the distal vas deferens with saline injection. For the proximal ends after canalization with pink Angiocatheter no. 18, epididymis underwent message to extrude the secretions of the proximal end. After ensured of the openness of two ends of Vas deferens, at first 4 full thickness 6-0 nylon sutures were set at hours 3, 6, 9 and 12 and then superficial partial thickness sutures between previous full thickness sutures were done .
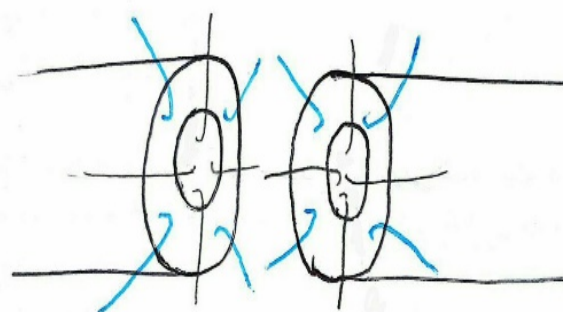
How to make Vasovasostomy via two-layer macroscopic procedure (fig. 1)

The explanations were given to the patients on the study process and they were invited to participate in the study. The written consent form was taken from patients. The patients tended to participate in the study and the information were released and the names were avoided to be mentioned. The research units had freedom of action in rejecting or accepting participation in the study. The collected data were analyzed via software SPSSV22. The significance level for all the tests was considered under or equal to 0.05.

Findings

In this study, 22 men who underwent Vasovasostomy surgery via two-layer macroscopic procedure at Shahid Beheshti hospital during 2011-2015 were participated. The youngest and oldest patients were at age groups 30 and 54 years old, respectively. Age of spouses has been between 26-42 years old with average age (36.73±4.63). The cause of Vasovasostomy in our study has been remarriage with 18 patients and the second cause has been death of children in three cases of couples and ultimately the last cause has been change of opinion in a patient(table 1). The surgery operation time has been in average 64.32±4.43. According to the VAS criterion, pain intensity at 6 hours after surgery in 1 patient (4.5%) has been without pain, and it has been in degree 2 in 12 patients (54.4 %) and it has been in degree 4 in 9 patients(40.9 %). pain intensity at 12 hours after surgery in 13 patient (59.1%) has been without pain, it has been in degree 1 in 2 patients (9.1 %), it has been in degree 5 in 5 patients(22.7 %), it has been degree 3 in 1 patient(4.5%) and it has been degree 4 in 1 patient(4.5%). Pain intensity in 21 patients (95.5%) has been without pain one week after surgery and it has been degree 2 in 1 patient (4.5%). Under the fewer intervals between vasectomy and Vasovasostomy, sperms have been more and sperm quality has been better than any of the above was not statistically significant (Table 2). Patency rate was estimated about 90.9% and the pregnancy in 6-12 month follow-up in the patients who took action has been successful. The spouse's average age was estimated 38 years in the patients without successful pregnancy and the spouse's average age was estimated 34.8 years in the patients with successful pregnancy, found insignificant with p=0.221. further, the patient's average age equaled to 42 and 44.18 years old in the patients succeeded for pregnancy and not succeeded for pregnancy, respectively, found insignificant with p=0.743(table 3). In average, the interval between vasectomy and Vasovasostomy has been 2.40±0.89 in the patients succeeded on getting pregnant and it has been 9.09±5.01 in the patients not succeeded on getting pregnant, found significant with p=0.009(table 3). Among fertile individuals, 5 patients(25%) were smoking and 15 other patients(75%) were not smoking and also 2 infertile patients(9.1%) were not smoking(p=0.632). 3 patients(27.3%) of patients who did not succeed on getting pregnant were smoking and 8 patients(72.7%) were not smoking. Further all the individuals who succeeded on getting pregnant consisted of 5 patients (100%) who were not smoking(p=0.467)(table 4).

DISCUSSION AND CONCLUSION

The present research as a retrospective cross-sectional study has been conducted on Vasectomy patients who were admitted to Shahid Beheshti hospital during 2011-2015. With regard to this study, the success rate at surgery and pregnancy has been 90.9% and 31.25%, respectively; the interval between vasectomy and Vasovasostomy has been 2.40±0.89 in the patients who succeeded on getting pregnant, indicated a significant relationship between this interval and the patients' pregnancy, i.e. the lesser this interval, the rate of success in pregnancy will be higher, found consistent with the studies by Patel & Feber[8][11]. With regard to the study entitled with clinical study on use of two-layer procedure in Vasovasostomy by Zhang Meng et al.(2011), the rate of fertility and pregnancy has been 90.2% and 80.4%, respectively; the rate of fertility has been the same as our study, but the pregnancy has been witnessed with higher percent that can be due to the long vasectomy interval in our study[12]. With regard to the

meta-analysis on the studies via two-layer microscopic Vasovasostomy procedure in 2015, rate of fertility and pregnancy with 10 year follow-up has been 89.4% and 73%, respectively; this indicates that rate of fertility same as our study, but the pregnancy has been in higher percent, so that a part of this difference can be justified regarding the short follow-up after surgery in this study compared to the mentioned meta-analysis [9]. To support this argument, it can mention the study by Safar nejad et al.(2013) so that 28% and 26% of the couples in microscopic and macroscopic surgery groups succeeded on getting pregnant in 12 month follow-up, found less than this study in bother groups[13]. With regard to the study entitled with comparison of single-layer macroscopic Vasovasostomy procedure via nylon thread and two-layer microsurgical Vasovasostomy procedure by Safari nejad et al.(2013), average surgery time in two-layer microsurgical procedure and single-layer macroscopic procedure has been 114 and 74 minutes, respectively. In the present study, the surgery time with approximate mean(64 minutes) has been better than the study by Safari nejad[13]. The relationship between sperm quality in the patients with patency and the interval between vasectomy and action to Vasovasostomy in patient was examined via regression analysis, that all the qualitative features of liquid sperm (semen) after surgery has had a negative relationship with the interval between two surgeries, found insignificant statistically. This can be due to low sample size in this study, suggested to resolve this in future studies. The relationship between smoking in fertility and pregnancy and the relationship between smoking and results from sperm analysis has been a new index examined in the present study. However the rate of fertility and pregnancy in the individuals who smoke has been less and the sperm analysis indicated poorer results in them, mentioned that they have not been significant statistically, which this can be influenced of low small size in this study. To sum up, the most important weakness in this study can be low sample size and short follow-up in terms of the couples' success for

pregnancy, hoped to resolve this in future studies. Despite hopeful results from this study, it cannot present conclusion regarding type of study. To sum up, it is recommended to conduct more comprehensive studies via clinical trial to examine success at Vasovasostomy with the technique introduced in this study compared to single-layer microscopic and macroscopic procedures so as to introduce this procedure as a new surgery procedure for Vasovasostomy.

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Tables

Table 1. Demographic information of 22 patients under study

Variables	Frequency	%
Smoking		
Yes	5	**22.7**
No	17	**77.3**
Comorbidity		
Yes	3	**13.6**
No	19	**86.4**
Number of children before Vasovasostomy		
1	2	**9.1**
2	12	**54.5**
3	7	**31.8**
7	1	**4.5**
Cause of Vasovasostomy		
1	4.5	**Changeof opinion**
18	81.8	**Remarriage**
3	13.6	**Death of child**

Table 2. the relationship between sperm quality in patients with patency with interval between Vasovasostomy and Vasectomy via regression analysis

Variable	semen volume	The number of sperm per ml Semen	The total number of sperm in a sample	The percentage of motile sperm	The percentage of motile Grade 3, 4 sperm	The percentage of sperm with normal morphology
Correlation Coeffcient	-0.033	-0.114	-0.081	-0.073	-0.265	-0.086
P.Value	0.885	0.612	0.720	0.747	0.233	0.703

Table 3. Rate of fertility and pregnancy after Vasovasostomy and their relationship with smoking

Variables	Total frequency N(%)	Smoking N(%)	No smoking N(%)	P. Value
fertility				
Yes	20(90.9)	5(25)	15(75)	0.632
No	2(9.1)	0	2(100)	
pregnancy				
Unsuccessful	11(50)	3(27.3)	8(72.7)	0.467
Successful	5(22.7)	0	5(100)	
Without action	6(27.3)	2(33.3)	4(66.7)	

Table 4. Results from sperm analysis and its relationship with smoking

Variables	Total mean	smoking	No smoking	P.Value
Voulme(ml)	2.95±1.32	2.80±0.84	3.00±1.46	0.543
Count(million)	14.82±10.74	15.95±13.82	15.11±9.34	0.595
Total count(million)	47.33±34.64	36.06±34.68	50.64±34.97	0.595
Motility(%)	40±29	37±29	43±27	0.359
Grade 3-4(%)	18±18	20±34	17±12	0.446
Normal morphology(%)	37±29	37±26	40±27	0.283