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EVALUATION OF PORTAL SITE HEALING WITH CLOSURE AND WITHOUT CLOSURE AFTER ARTHROSCOPIC PROCEDURE- A RANDOMIZED PROSPECTIVE STUDY

Kiran S Patil, Haridas M Somayaji, Santhosh S Nandi, Deepesh Daultani, Mallikarjun Ithli

Department of Orthopaedics, Shri B.M. Patil Medical College and Research Centre, Solapur Road, Bijapur, KA, India

E-mail of Corresponding Author: dr_hari81@rediffmail.com

ABSTRACT

Objective: To compare the two methods of management of the arthroscopic portal sites.

Background: The methods of managing the Arthroscopy Portals are not standardized. The options are to close with the use of Non Absorbable Sutures or leave it open with sterile simple dressing. This study compares the two methods of management.

Material and Methods: We present the outcome of 70 knee Arthroscopies carried out over a period of 24 months in Shri. B. M. Patil Medical College, Bijapur which were chosen alternatively into two groups one with simple sutures other with simple dressings. Outcome measures adopted were level of pain, redness, localised swelling, superficial infection, appearance of the wound after healing. Any observations were reported by an independent observer who was blinded with method of management.

Results: No patient was lost during follow up. There was significant difference in the two groups with regards to the redness, swelling, severity of the pain and cosmesis.34% patients developed redness in suture group while only 5% patients developed redness in simple dressing group. 28% patients developed mild to moderate swelling in suture group while only 2% patient developed mild swelling in simple dressing group. 5% patients developed minimal superficial infection in suture group while no patients developed such complication in simple dressing group. Regarding the scar appearance 71% were happy in sutured group while 97% were happy in simple dressing group. Fifteen patients in suture group suffered mild to moderate pain while five patients suffered mild pain in simple dressing group. There was no long term complication in any patients.

Conclusion: From our findings we suggest that it is preferable to leave arthroscopy portals open with simple dressing.

Keywords: Arthroscopy, portal sites, portal closure.

INTRODUCTION

Knee arthroscopy is a minimally invasive surgical procedure performed to diagnose and treat intra-articular knee problems. The portals are created with a No. 11 blade incising the skin, subcutaneous tissue, and capsule.[1]. Under normal circumstances two portals are sufficient for most arthroscopic operations.[2]. Although rare, issues with portal healing may occur in association with arthroscopic knee procedures. [3]. Most wound problems are of minor severity and can be treated conservatively. Suturing of the wounds is not necessary and use of a sterile adhesive tape or leaving the wounds open is adequate. The portal wound complication rate was approximately 10% using either method.[1]. Very few studies have been carried out regarding this portal site management.

Here we carried out a single blind, prospective randomised study comparing the two methods of

portal site management either sutured or just covered by simple sterile dressing.

MATERIAL AND METHODS

This study was performed in B.L.D.E.U's medical college hospital and research centre, Bijapur and included patients who went arthroscopy of the knee joint by a single surgeon during the period from July 2010 to June 2012 over a period of 24 months. Inclusion criteria were all adult patients underwent arthroscopy of the knee joint either for diagnostic or therapeutic procedures with not more than 5mm stab incision for each portals. Exclusion criteria were procedure requiring longer incision [more than 5mm]; premorbid conditions like diabetes mellitus, septic arthritis. Single surgeon carried out all the procedures and 5mm stab incision made for each portal. Procedure carried out using tourniquet. Ringer lactate used as lavage solution. Portal sites either closed with mattress suture with 2-0 ethilon suture material or by covering the wound with simple sterile dressing. Supportive Jones bandage was given. Wounds were inspected at the end of 2nd, 5th, 8th postoperative day by an independent observer [nursing staff] who was not present during the surgical procedure and dressed. Sutures were removed at the end of 12-14th postoperative day. Any problems at this time were reported by the same independent observer. Patients were discharged after suture removal or wound is healed.

All the patients followed up after 6 week interval for routine check up as outpatient basis. Same independent observer attended even during the follow up period. Severity of the pain (using visual analog scale [4]), redness, localised swelling, and superficial infection with respect to discharge were notified by the independent observer. Patients were asked about the appearance of the scar after healing with which they were satisfied or not. When the pain was present it was asked whether the pain is from portal site or deep inside. Problems related to the original pathology were not taken as to restrict our documentation related to portal sites only.

Statistical methods

Pilot study was conducted and 35 patients for each group were taken as sample size and p value of less than 0.05 was taken for significance. Z value, percentage were used as diagnostic statistical tests to evaluate the results.

RESULTS

Totally seventy patients were studied by choosing alternatively into each group. There were 23 males [65.71%] in each group and average age is 34.7 years [range- 20-59]. Table 1 gives the common indication for the arthroscopic procedure carried out. All the patients had 2 portals each which accounts to 70 portals for each group. No patient was lost in follow up. Mean operating time was 45.14 minutes for suture group and 43.14 minutes for simple dressing group [table-4].

There was significant difference in the two groups with regards to the redness and swelling. Twelve [34%] patients developed redness in suture group while only two [5%] patients developed redness in simple dressing group. Ten [28%] patients developed mild to moderate swelling in suture group while only one [2%] patient developed mild swelling in simple dressing group. Two [5%] patients developed minimal serosanguinous discharge suggesting superficial infection in suture group while no patients developed such complication in simple dressing group[table-2 a&b]. Suture removal was delayed by week for these patients and portal site healed by 4th week with regular dressing and oral antibiotics. All the portal sites in both the groups healed completely by 4 weeks without any complications. However regarding the scar appearance satisfaction twenty five [71%] were happy in sutured group while thirty four [97%] were happy in simple dressing group [table-2

a&b]. This shows the significant difference with respect to the cosmetic result.

Severity of the pain assessed using VAS [4] were more with the patients who are sutured [table-3]. Fifteen patients [42.85%] in suture group suffered mild to moderate pain while five patients [14.28%] suffered mild pain in simple dressing group.

However there was no long term complication in any patients with respect to the portal sites in both groups. But there was highly significant difference in the overall complication rate [p value less than 0.001; z value=2.52] favouring the simple dressing group [2.28%] over suture group [19.42%][table-5].

DISCUSSION

Our results indicate that leaving arthroscopy portals open is an acceptable method of wound closure. This study suggests that open management of arthroscopy portals results in high patient level satisfaction. Hussein et al in their study reported that there were no major or long term complications with portal site healing and concluded that leaving knee arthroscopy wounds open is an acceptable method of management, which concurs with our study. And furthermore, although the use of suture material for closure of knee arthroscopy portals has decreased, many surgeons continue to use adhesive tape, assuming this is superior to leaving them open. And we conclude that there is no significant difference between the two methods of treatment either with adhesive tape or simple sterile dressing. [5].

There was a difference in the patients who perceived pain using VAS [4]. Fifteen patients in suture group suffered mild to moderate pain while five patients suffered mild pain in simple dressing group. Among these eight patients scored scale4 in sutured group where as only two patients scored scale 4 in open group. The patients scored 4 or more had either redness or swelling or both. According to Michael J Strobel, joint swelling may persist for some time after arthroscopy [6]. The pain would have been probably attributed to the distension of soft tissues or local tissue reaction due to retention of the secretion. As retention is more after closure, more number of patients in sutured group perceived pain even in number and in intensity [table-3].

There was a significant difference in the redness and swelling which were more in sutured group [table-2a &2b]. This would have been attributed to the effusion and local tissue reaction which was more in sutured group due to fluid retention.

Two [5%] patients developed superficial infection in suture group while no patients developed such complication in simple dressing group. An analysis by

SMALL of more than 10,000 arthroscopic operations showed infection rate of 12.1% which includes both superficial and deep [6]. This concludes that infection rate is minimal in our study and bacterial colonization of the suture track is the reason for superficial infection in suture group. Gristina AG, ET AL observed that colonizing bacteria are enveloped in a copious exopolysaccharide glycocalix, protects the bacteria from host defence factors and accounts for their persistence on the suture surfaces until they are removed with the sutures. [7]

Scars of open group appeared cosmetically better than scars of sutured group.[table-3b.]. However there were no problems with the healing in any group. As christosis k states, following the arthroscopy unobstructed healing is a rule. Uncommon cases of synovial fistula were seen and reported rate is 0.0117%-0.61% [1].

Bhattacharyya M, ET AL, states that the method portal site management with adhesive tape was associated with a reduced potential for infection, faster renewal of tensile strength, greater cost effectiveness, and better cosmetic effects comparing with suture closure.[8]. We also state the similar result with simple dressing for the portal site management.

The method of management employed has implications on time saved in theatre including a reduced tourniquet time [table-4], and on cost. Tourniquet time should be minimized to prevent possible deep vein thrombosis and ischemic neurovascular changes [9]. The price of the suture material is saved and also the cost and time of removal of sutures either at outpatients, or by the practice nurse. If portals were left open then patients would not need to attend for removal of sutures and could simply have one follow up appointment at outpatients. This cost increases if more expensive sutures or staplers are used and further outpatient episodes are required for suture removal. In a study by Zempsky WT, et al, lowest average cost per laceration for sutures were $24.11[10]., Even though we have not come across any needle stick injury, percutaneous needle stick injury is one of the major risk factors in the transmission of hepatitis C, hepatitis B and HIV among healthcare workers. The commonest clinical activity to cause the needle stick injury was blood withdrawal (55%), followed by suturing (20.3%) [11]. It is pertinent to develop surgical techniques to avoid needle stick injuries among healthcare workers.

Even though this study is a controlled trial, observations like severity of pain and appearance of scar are subjective variables leading to the chances of bias. However we tried to minimize these by keeping same independent observer who is not a part of team during surgical procedure for all the patients.

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CONCLUSION

The present study shows that managing the arthroscopic portal with simple sterile dressing has an advantage over the suturing the portals. We propose that all normal sized arthroscopy portals can be left open and covered with simple dressings. This would not only lead to high patient satisfaction with the appearance of their wounds, but also save time and money which is an ever important consideration today; prevents the possible needle stick injuries and reduces the burden on our health services.

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List of abbreviations

VAS- Visual Analog Score.
mm- Millie Metre.
p value- Probability value
z value- Relative deviate value.

Table-1 indications of arthroscopy

INDICATION	OPEN	CLOSED	TOTAL
1.diagnostic arthroscopy and partial meniscectomy.	28	27	55
2.debridement and washout in osteoarthritis.	05	07	12
3.loose body removal and joint lavage	02	01	03

Table; 2a Complication:- Present or Bad (code;-2)

Complication	Male		Female		Total	
	Open	Closed	Open	Closed	Open	Closed
Redness	0	6	2	6	2	12
Swelling	0	4	1	6	1	10
Sup. Inf	0	1	0	1	0	2
Bad Cosmosis	1	5	0	5	1	10
Healing	0	0	0	0	0	0

Table; 2b Complication:-% Presentt or %Bad (code;-2)

Coplication	Male		Female		Total	
	Open	Closed	Open	Closed	Open	Closed
Redness	0.00	26.00	16.6	50.00	5.71	34.28
Swelling	0.00	17.39	8.33	50.00	2.85	28.57
Sup. Inf	0.00	4.30	0.00	8.33	0.00	5.71
Bad Cosmosis	4.30	21.73	0.00	41.66	2.85	28.57
Healing	0.00	0.00	0.00	0.00	0.00	0.00

Table: 3 Superficial Pain

VAS SCORE	0			2			4			6		
	M	F	T	M	F	T	M	F	T	M	F	T
Open	20	10	30	3	0	3	0	2	2	0	0	0
Close	16	04	20	4	2	6	3	5	8	0	1	1

Table: 4 Test of significance between Operation timings Of open & closed

	Mean	SD	Z-Value	P-Value
SUTURED	45.14	6.12	1.99	<0.05
SIMPLE DRESSING	43.14	5.8		

Table: 5 Test of Significance between open and closed with respect to overall complications

	Percent present	Percent absent	Z-Value	P-Value
SUTURED	19.42	80.58	2.52	<0.001
SIMPLE DRESSING	2.28	97.72		

Fig.1:- cosmetically bad scar following suturing.

Fig.2:- incision wound managed with dressing

Fig.3:- redness and swelling following suture of the wound.

Fig.4:- superficial infection following suture.

Fig.5:- swelling following suture