

Study of Ropivacaine Block to Reduce Post-Operative Pain after Strip Harvesting, And Relation of Width of Strip to Post-Operative Pain

Dr. Anil Kumar Garg^{*1} MBBS., MS, MCh Plastic Surgeon

Diplomate of American Board of hair Restoration

www.anilgarg.com

Email id - anilgarg61@yahoo.com

Dr. Seema Garg² MBBS., MSc

Diplomate of American Board of hair Restoration

Rejuvenate hair transplant Centre

2/1 RS Bhandari Marg, Indore 452003, India

www.rejuvenatehairtransplant.com

Email id - seema@anilgarg.com



Abstract:

Introduction - Strip method of follicle harvesting has great advantage but Post-operative pain as well as fear of pain is commonest complain of this surgery. Severity of post-operative pain is in direct relation to width of strip harvested. It is mandatory to reduce post-operative pain to make this method more acceptable for patients.

Objective - This study was done to know the effect of Ropivacaine infiltration post operatively and width of harvested strip on donor site pain.

Method- Grading was given by author for post-operative pain. Grading done on criteria of severity of pain and post-operative sleep disturbance. Initial data were collected from patients about pain severity and sleep disturbance from cases where strip was 2 cm wide and it was noted that pain incidence was very high. Then in test group post operatively Ropivacaine 0.5 % was infiltrated along suture line. In second study - the strip was 1.5 cm in centre and 1 cm on lateral side. Again in test group Ropivacaine infiltration given post operatively while in control group no infiltration given. Data were collected and analysed.

Observation - There was significant pain in patient where strip width was 2 cm as compare to patients where strip width was 1.5 cm. There was significant reduction of pain in those with strip width 1.5 cm and infiltration of Ropivacaine was done.

Conclusion - Severity of pain is directly proportional to width of harvested strip. The post-operative infiltration of Ropivacaine 0.5 % along suture line significantly reduces post- operative pain

Keywords - Post operative pain, Ropivacaine, strip width for follicle.

Introduction

Strip method of follicle harvesting has great advantages. It has some disadvantages as well, which are more because of its technical error. Post-operative pain as well as its fear is commonest and major drawback of this surgery. Post-operative pain is because of tension in suture line, and tension on suture line is in relation to width of strip harvested. More the width of strip more will be tension on suture line so more post-operative pain in donor area.

Quality of scar like wide scar, hypertrophic scar and or keloids in scar also depends mainly on tension over suture line^{3,5,6}.

Two studies were done with two objectives. One was post-operative pain in relation to width of harvested strip. Another objective was effect of local anaesthetic agent Ropivacaine 0.5% infiltration over suture line to see reduction in post-operative pain. In “study I” harvested strip width was 2.0 cm in centre and 1.5 cm on lateral side. Then in “study II” width of strip was reduced to 1.5 cm in centre and 1.0 cm on lateral side. In both study test groups was

given local anaesthetic agent Ropivacaine 0.5% post operatively along suture line, while in control group Ropivacaine infiltration not given. We observed width of strip is important determining factor for pain and infiltration of Ropivacaine further significantly reduces it.

Objective

Study was done to know -

- 1) The effect of Ropivacaine infiltration post operatively on donor site pain after strip harvesting.
- 2) The effect of width of strip on post-operative donor site pain.

Method

All cases included in this study were male and underwent strip method (FUT) of follicle harvesting. The entire study done over period of three years. Cases in those second strip was done were excluded from study. All patients were male ranging from 23 years of age to 55 years of age having androgenic alopecia Norwood Grade IV to VII and on average range of 2500 to 3300 grafts were done in one sitting. Two studies were done at different time period in same operating conditions and by same surgeons team with similar technique of closure of strip wound.

In “study I” strip width in centre was 2 cm and lateral 1.5 cm wide and in “study II” strip width in centre was 1.5 cm and lateral 1.0 cm. In both study test group infiltration of local anaesthetic Ropivacaine 0.5% given and control group no local anaesthetic given. All patients went home on same day and they were called on 4th and 18th hours of surgery. Specific questions were asked about pain. The questions were did they have pain? If yes how severe it was?, very severe, or moderate or minimal. Another set of questions were, could you sleep well? If not was it because of pain? If yes how much you could sleep. All answers were recorded by assistant and reported to author in morning and their pain was graded as per pain grade described below.

“Pain Grading” given by author for Patient’s post-operative pain and sleep disturbance.

Grade I - Minimal or no pain and could sleep well.

Grade II - Severe pain with disturbed sleep because of pain.

Grade III - Severe pain and could not sleep because of pain.

Ropivacaine 0.5% -

Ropivacaine^{2,4} is safest long acting local anaesthetic with least cardiac and CNS toxicity. It has greater selectivity for sensory blockade and shorter motor block. DOSE - 3-5

mg/kg. Author is using this for last four years in all cases of hair transplant surgery.

Observations

Observation I - In “Study I” control group all patients had strip width 2 cm in centre occipital region and 1.5 cm in lateral mastoid and or supra auricular region. No infiltration was given on donor site. The complains about pain, its severity and sleep problem were collected from patients.

We observed that the 50% patients had Grade II pain, while Grade III was 30 % and only 20% patients had minimal pain and could sleep.

Results of “Study I” control group with skin width 2 cm in centre, 1.5 cm lateral without infiltration of Ropivacaine.

Grade I - minimal /no pain, slept well (10 patients) - 20%

Grade II - pain with disturbed sleep (25 patients) - 50%

Grade III - severe pain, could not sleep (15 patients) - 30%

Observation II - In “Study I” test group 50 patients were selected. We did infiltration of 0.5% Ropivacaine post operatively along suture line of strip surgery. Around 10 ml of 0.5% Ropivacaine was infiltrated below suture line blocking all posterior nerves (greater and lesser occipital and post auricular nerves). As a routine patients were called at 4th and 18th hrs after surgery and information about pain severity and sleep were taken. In this study test group strip width in centre was same as was in control group (central 2cm, lateral 1.5cm).

Results of “Study I” test group with Ropivacaine infiltration (skin width 2 cm in centre, 1.5 cm lateral)

Grade I - minimal /no pain, slept well (22 patients) - 44%

Grade II - pain with disturbed sleep (18 patients) - 36%

Grade III - severe pain, could not sleep (10 patients) - 20%

We observed that certainly complain of pain reduced from 80% to 56% (Grade II+III), and pain relief percentage increased from 20% to 44%. Still almost 50% of our patients complain of pain.

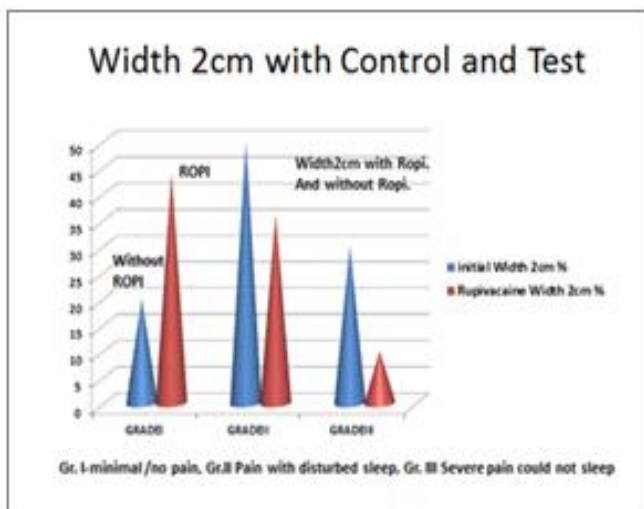


Figure 1.0 Percentage of patients with post-operative pain with and without infiltration of Ropivacaine, control and study group (strip width 2 cm in centre and 1.5 cm on lateral side)

Observation III - This “study II” was conducted during period Nov 2015 to April 2016. All cases had strip width in centre 1.5 cm and on lateral side 1.0 cm. Total 82 cases of strip surgery were done. Out of 82, eight cases of second strip were excluded.

Total 74 cases were divided in control group of 12 patients and test group of 62 cases.

Test group patients were given 0.5% Ropivacaine infiltration along suture line of strip post operatively.

Control group 12 cases were not given any local anaesthetic agent post operatively.

Patients were called post operatively at 4 and 18 hrs after surgery. As per information about severity of pain and sleep all patients were classified in pain grades.

Results of “Study II” control group with skin width 1.5 cm in centre, 1.0 cm lateral without infiltration of Ropivacaine.

Grade I - (minimal.no pain, slept well) 4 CASES- 33.33%

Grade II - (pain disturbed sleep) 5 CASES - 41.66

Grade III - (severe pain and could not sleep) 3 CASES - 25%

Master table showing compilation of both study groups.

	Study I-Width 2 cm		Study II Width 1.5 cm	
	Control -Without Ropi. %	Test – With Ropi. %	Control -Without Ropi %	Test – With Ropi %
Grade -I	20	44	33	89
Grade -II	50	36	42	08
Grade -III	30	20	25	03

Figure 3. Indicating percentage of patients with pain grading with and without Ropivacaine and with different strip width.

We can see that even after reducing strip width (Ropivacaine is not given post op.) pain was there in around 68% of cases. (Grade II +III)

Observation Table IV - Results of “Study II” Test group with skin width 1.5 cm in centre, 1.0 cm lateral with infiltration of Ropivacaine.

Grade I - 53 PATIENTS - 88.33%

Grade II - 5 PATIENTS - 8.33%

Grade III - 2 PATIENTS - 3.33%

We observed that post-operative pain was remarkably reduced, Grade III very severe pain and could not sleep were only 3.33 % after Ropivacaine infiltration but in the same group without Ropivacaine infiltration Grade III pain was 25%, while Grade II pain reduced from 41.66 % to 8.33% after Ropivacaine. The percentage of patients who were pain free or had minimal pain and could sleep also increased from 33.33% to 88.33%.

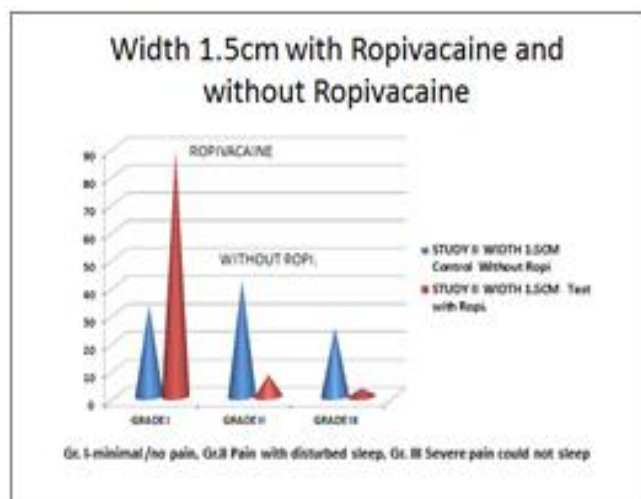


Figure2. Percentage of patients with post-operative pain with and without infiltration of Ropivacaine (strip width 1.5 cm in centre and 1.0 cm on lateral side)

Compilation of both study were done, to compare the Grading of pain in relation to width and with and without Ropivacaine infiltration. Figure 3 Indicates compilations of all group data.

Discussion

Pain is biggest fear factor in patient's mind for taking decision to undergo hair transplant. The strip method of follicle harvesting is unpopular because of post-operative pain as well as fear of pain on donor site. During our initial phase of hair restoration practice we also faced it and worked to solve the problem of post-operative pain.

Ropivacaine 0.5% is a very safe newer local anaesthetic with least cardiac and CNS toxicity and we were using it for local nerve blocks. Giving Ropivacaine local infiltration near incision of strip remarkably reduced the pain as well as reduction in anxiety of having pain. In this pain free period patient had sleep induction. But still we were getting complaints of pain. We realised the width could be the cause. We searched the data and found that our usual strip width used to be around 2cm in centre and 1.5 cm on lateral side. We thought of reducing the strip width. Pre-operative skin laxity is main determining factor to decide for width of strip. There was significant reduction in post-operative pain (pain Grade I 88.88%).

We all know mechanism of pain. Incision in skin in itself is not the cause of pain but when there is tension over suture line or in the area, the nerves endings will be compressed and will induce the pain. More width of skin strip will certainly cause more tension over and near suture line and will induce pain and that is the reason even after Ropivacaine infiltration patients were feeling pain as strip width was wide (2 cm in centre and 1.5 cm on lateral side). The reason is that Ropivacaine works for 3 to 4hrs only but if width is wide pain will take its own course. Reduction in strip width reduces pain even in group where local Ropivacaine was not given. But the pain got significantly reduced with Ropivacaine infiltration with reduced width of strip.

Conclusion

Most common complaint of strip surgery is post-operative pain and this is rather biggest limitation for opting this method for follicle harvesting.

Ropivacaine 0.5% effectively control post-operative pain.

Width of strip has direct relation to post-operative pain. We shall, rather we should not take strip wider than 1.5 cm. even with reduced strip width and good laxity of skin patient will have post-operative pain and sleep disturbance which can be significantly reduced by infiltration of Ropivacaine 0.5% local anaesthetic agent along suture line when patient is going home.

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