



Advocating Platelet Rich Plasma Therapy (PRP) as Assuring Treatment Modality in Acute Fissure in Ano-A Case Report

Ishan Parashar¹, Archana Kukade-Shinde², Sanjay Babar³, J Jayashri⁴

¹PG scholar, department of Shalya Tantra, Dr. D. Y. Patil college of Ayurved & Research Center, Dr. D. Y. Patil Vidyapeeth, Pune (Deemed to be University) sant Tuka ram nagar Pimpri, pune 411018

²Associate Professor, Department of Shalyatantra, Dr. D. Y. Patil college of Ayurved & Research Center, Dr. D. Y. Patil Vidyapeeth, Pune (Deemed to be University) sant Tuka ram nagar Pimpri, pune 411018

³Professor, Department of Shalyatantra, Dr. D. Y. Patil college of Ayurved & Research Center, Dr. D. Y. Patil Vidyapeeth, Pune (Deemed to be University) sant Tuka ram nagar Pimpri, pune 411018

⁴PG scholar, department of shalya tantra, Dr. D. Y. Patil college of Ayurved & Research Center, Dr. D. Y. Patil Vidyapeeth, Pune (Deemed to be University) sant Tuka ram nagar Pimpri, pune 411018

Email: ishanparashar111@gmail.com¹, archanakukde@yahoo.co.in², sanjaybabar14@gmail.com³, jayashriyashankar@gmail.com⁴

ORCID ID: 0000-0003-4210-9998¹, 0000-0003-4332-4008²

*Corresponding author's E-mail: ishanparashar111@gmail.com

| Article History | Abstract |
|--------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Received: 06 June 2023 Revised: 05 Sept 2023 Accepted: 12 Oct 2023 | <p>PRP or autologous platelet-rich plasma, has been hailed as a successful method of treating wounds. There is, however, still a shortage of data to back up its application in patients with both acute and chronic wounds. This study set out to thoroughly investigate the efficacy, synergy, and potential mechanism of PRP-mediated treatment for acute fissure-in-ano. Acute fissure with indications of pain, bleeding, and elevated sphincter tone was identified at six o'clock. As a control, PRP was applied to the area of the fissure. The pace of fissure healing, as well as the reduction in discomfort, bleeding, and sphincter tone, were evaluated on the third and tenth days. PRP significantly enhanced fissure healing, which was connected to wound healing control, angiogenesis augmentation, re-epithelialization, and collagen deposition. As PRP raises local vascular intensity, enhances re-epithelialization, and is linked to increased growth factor production, it dramatically improves the healing process of fissures while also reducing discomfort, bleeding, and worsened sphincter tone.</p> |
| CC License CC-BY-NC-SA 4.0 | <p>Keywords: Platelet rich plasma (PRP) therapy, Fissure in ano, angiogenesis, re-epithelialization</p> |

1. Introduction

A linear or oval-shaped tear in the anal canal that begins just below the anal verge and continues to the dentate line is known as an anal fissure. Lockhart-Mummery initially characterized it in 1934.^{1,2} Fissures in the anal can be acute or chronic. A small rip in the anoderm characterizes acute fissures. Anal spasm, bleeding while urinating, and/or pain are all signs of acute fissures. Although the precise cause of an anal fissure is unclear, it is believed to be the result of damage to the anal canal. This includes anoderm trauma from passing through hard or large bowel movements, localized diarrheal itchiness, anorectal surgery, and ano-receptive sex. Patients often feel more pressure in the anal canal as a result of the fissure. According to several studies, patients with fissures had higher internal anal sphincter resting pressure than healthy controls.^{3,4,5,6,7,8,9} Some of the discomfort and spasm associated with feces are caused by this hypertonicity of the anal sphincter, which also impairs wound healing by decreasing blood flow to the injured anoderm.

There is proof that the recto anal inhibitory reflex is followed by an abnormally elevated contraction in patients with anal fissures. This may explain the sphincter spasm and discomfort anal fissure sufferers feel during defecating.¹⁰ Acute anal fissures are brought on by the trauma brought on by the strained evacuation of a hard stool or, less frequently, the recurrent passage of diarrhoea. The illness is characterized by severe anal pain with feaces and the passage of fresh blood. Several medical specialties presently use platelet rich plasma (PRP) therapy. It is used for several things, including re-epithelialization, collagen deposition, wound healing, and angiogenesis.

Platelet rich plasma (PRP), a biological substance with a platelet concentration above the normal range, is present in the plasma portion of autologous blood. It is made from previously drawn and centrifuged patient blood.

A 23-year-old male patient arrived complaining of pain in the anal region during defeacation, constipation for the previous two years, and bleeding for the previous four months. who has never had diabetes or high blood pressure diagnosed. He visited Shalya Tantra Out patient department at Dr. D.Y. Patil College of Ayurved and Research Center, Pimpri, for additional care.

2. Clinical Findings

During the initial general examination, the patient's hemodynamics were stable. However, when the patient was examined locally, a P-R examination revealed an acute fissure at 6 o'clock with increased sphincter tone, no signs of induration, and acute bleeding.

Table 1: Vitals

| | Reading | Unit |
|------------------|----------------|-------------|
| Blood Pressure | 120/70 | Mmhg |
| Pulse Rate | 74 | /Min |
| Respiratory Rate | 14 | /Min |
| Temp | 97 | F |
| Weight | 74 | Kgs |

Table 2: Systemic examination

| | |
|------------|-------------------------------|
| CNS | Conscious and oriented to TPP |
| CVS | S1 & S2 NORMAL |
| RS | AEBE |

Diagnostic Focus And Assesement

Table 3: Investigations

| | Reading | Units |
|-------------------------|----------------|--------------|
| Hb | 14.2 | Gms |
| Rbc | 4.68 | cu/mm |
| Wbc | 4800 | cu/mm |
| PC | 1.88 | cu/mm |
| BLOOD UREA LEVEL | 24 | mg/dl |
| Sr.creatinine | 0.8 | mg/dl |
| HIV | Negative | |
| HbsAg | Negative | |

Anal Fissure Assesment

Objective Parameter; (1) Bleeding;(2) Pain; (3) Sphincter tone

Table 4: Bleeding Per Anal Region

| Bleeding | Grading |
|-------------|---------|
| No Bleeding | 0 |
| 1-2 Drops | 1 |
| 5-10 Drops | 2 |
| 10-20 Drops | 3 |

Table 5: Pain In Ano According To Vas Scale -¹¹

| Vedana (pain) | gradation |
|--------------------|-----------|
| Based on vas scale | 0-10 |

✖

Table 6: Sphincter tone-: Acc to DRESS SCORE¹²

| Sphincter Tone | Gradation |
|---------------------|-----------|
| Extremely Tight | 5 |
| Normal | 3 |
| No Discernable Pain | 0 |

Table 7: Local examination

| Location | Midline posteriorly (6'o clock) |
|---------------------|---------------------------------|
| Acute bleeding | Absent |
| Pain | 6(vas scale) |
| Edges | Non-indurated |
| Number | 1 |
| Size(extension) | From dentate line to anal verge |
| Duration of fissure | Since two years (on & off) |

Therapeutic Focus and Assessment

Aim of the Treatment; (1) To facilitate healing; (2) To improve sphincter tone; (3) To reduce pain

Preoperative

Methods used to obtain PRP

5 ml of the patient's whole blood is drawn via vein puncture and placed in anticoagulated tubes. The blood is then centrifuged using a two-spin procedure. After centrifugation, the tube shows three layers: red blood cells on the bottom, leukocytes on top, and PRP, which is extracted and used further.



Figure1: Centrifugation Machine

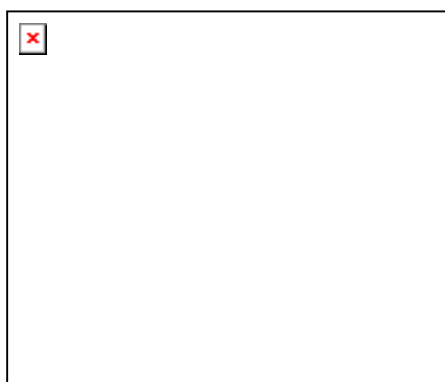


Figure 2: PRP SAMPLE -After Centrifugation At 300rpm

Intra-Operative Procedure

With Inj. Anawin 0.5%, spinal Anesthesia was administered with all aseptic measures. In lithotomy position Anal dialatation was done by Lords’s Method up to 4 fingers. Anal spasm was relieved, a Sims speculum was placed in the anal canal, and the fissure bed was visualized at the hour marker. PRP sample is drawn and injected with an insulin needle at a 45-degree angle into the fissure bed up to submucosal layer. Complete Haemostatsis achieved. Dressing done under all aseptic precautions. Patient shifted to recovery room in stable condition. Video link of Intra operative procedure as below

<https://drive.google.com/file/d/1guU0BrcaW7QDNMH6zjcOHgAup3TYbTJW/view?usp=drivesdk>

Table 8: Postoperative Medication

| S.no | Drugs | Dosage | duration | Route of drug administration |
|------|-------------------------------------------------------------|------------------------|------------------------|------------------------------|
| 1 | Inj. Monocef | 1 gm | Twice a day for 3 days | Intravenous |
| 2 | Inj.PAN | 40 mg | Twice a day for 3 days | Intravenous |
| 3 | Inj.Emset | 4mg | If needed | Intravenous |
| 4 | Intravenous fluids- Ringer Lactate Normal saline 0.9% | 500ml 500ml@60ml/hr | For first 24 hours | Intravenous |
| 5 | Syp. Cremaffin plus | 10ml | At night for 3days | Orally |

Observation

The fissure bed was healthy, the induration and spasm were lessened, the pain level was -2 (on the VAS scale), and the patient had no complains of blood when urinating. This was the third postoperative day. The fissure was fully healed after 10 days.



Figure 3 -day 0



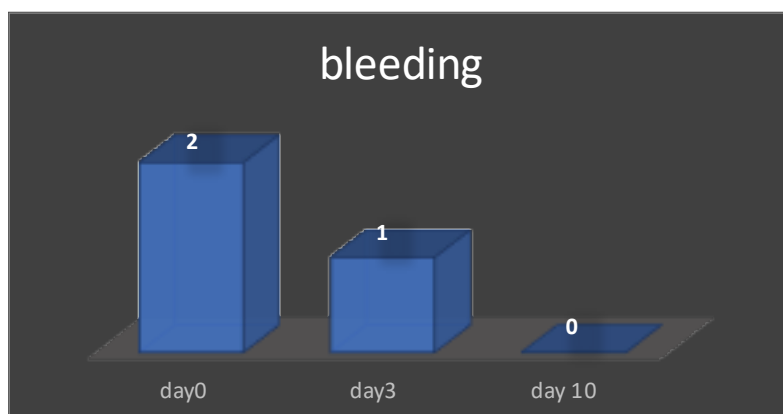
Figure 4 -day 3



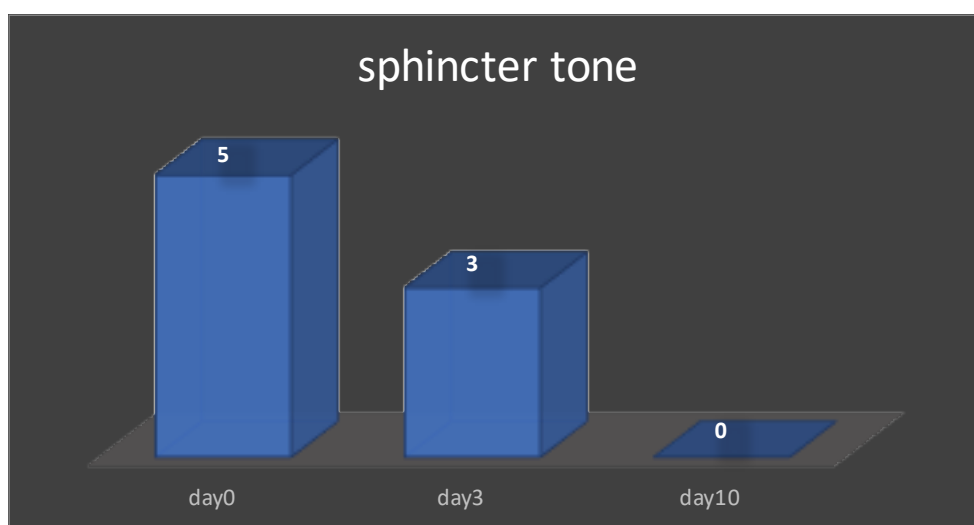
Figure 5-day 10

Table 8: Assessment Table

| ASSEMENT CRITERIA | BEFORE TREATMENT | Day 3 | Day 10 |
|-------------------|------------------|----------------|-------------------|
| Pain | 6 On Vas Scale | 2 ON VAS SCALE | ZERO ON VAS SCALE |
| Bleeding | 2 | 1 | 0 |
| Sphincter Tone | 5 | 3 | 0 |



Graph 1: Graphical representation showing improvement in bleeding per ano on day 0,3 and 10



Graph 2: Graphical representation showing improvement in sphincter tone on day 0,3 and 10



Graph 3: Graphical representation showing improvement in pain on day 0,3 and 10

Table 9: Showing Timeline of Treatment and Observations

| Day | Treatment | Observation |
|------------|--------------------------|-----------------------------------------------------------------------|
| 11.10.2022 | PRP injected | Edges -Indurated, Sphincter tone- extremely tight, Painscale -6 |
| 14.10.2022 | First follow up Dressing | Edge-Induration reduced, Sphincter tone -normal Painscale-2 |
| 21.10.2022 | Second follow up | Edges- normal, Sphincter tone - no discernable pressure, Painscale -0 |

There are several treatment options for fissure in ano, including conservative and surgical methods. However, the healing process was quick and there were no adverse effects in this case compared to other conservative treatments, such as different ointments, which have a delayed healing period and their own drawbacks. Fissurectomy, a surgical procedure used to cure fissures, causes tissue damage that results in a significant scar and can be worsened by anal stenosis, as opposed to PRP treatment, which did not cause any scarring and caused very minor tissue damage. PRP, a minimally invasive procedure with few side effects, was chosen to treat the ano fissure. Additionally wounds have a proinflammatory biochemical milieu that hinders the healing of both acute and chronic ulcers, as well as a high level of protease activity that lowers the concentration of functional GF13. Anal fissures or 'flaws' histology appeared to be more consistent with an unstable anodermal scar than with ulcer features¹⁴. As a result, the treatment plan is the same as for wounds. PRP injections cause the creation of new blood vessels, adipose tissue, as well as the activation of fibroblasts and the deposition of new collagen in the dermis and immediate subdermis.^{15,16} A few of the growth factors and cytokines that activated platelets in PRP can release are platelet derived growth factor (PDGF), basic fibroblast growth factor (Bfgf), vascular endothelial growth factor (VEGF), insulin-like growth factor-1 (IGF-1), and transforming growth factor (TGF-)¹⁷. It is used as an intriguing alternative treatment for wounds to encourage healing in fissures since it is a source of GFs and has mitogenic, angiogenic, and chemotactic characteristics as a result¹⁸. Here, the aggregation process is predominantly carried out by platelets. the three processes of adhesion, activation, and aggregation serve as the primary means through which it contributes to homeostasis¹⁹As a result, the acute fissure in ano is healed, and the pain and bleeding at the fissure site are decreased. Additionally, there was a noticeable improvement in sphincter tone as a result of the fissure wound gradually healing and creating less irritation.

Table 10: Main Roles Of Growth Factors In Platelet-Rich Plasma ²⁰

| GROWTH FACTORS | MAIN FUNCTIONS |
|----------------|--------------------------------------------|
| PDGF (27) | Vascularization Angiogenesis stimulator |
| EGF(29,43) | Angiogenesis stimulators |
| HGF(36) | Angiogenesis stimulator |
| FGF(29,43-45) | Angiogenesis stimulator |
| IGF-1(6,27,46) | Angiogenesis stimulator |

3. Conclusion

We conducted the first thorough investigation of PRP's impact on fissures, which revealed that PRP has a crucial role in promoting healing, improving sphincter tone, and reducing bleeding. Although there are still some molecular mechanisms that need to be thoroughly investigated it has a significant impact on re-epithelialization, it promotes angiogenesis, it also plays a role in collagen deposition and wound contraction. Our research supports the use of PRP as an adjuvant to hasten the healing of anal fissures. On the long term effects of PRP on fissure healing, more investigation is needed.

Limitation of the study: This course of treatment was created with consideration for the patient's unique makeup, medical history, and investigational findings. This is only a case study, so additional research with an appropriate research design is required for the scientific validation.

Declaration of patient consent: The authors affirm that they have a patient's signed authorization form for the dissemination of clinical data that obscures the identities of specific people.

Conflict of interest: Nil

Source of support: None

Authorship

Each of the identified authors made substantial intellectual contributions to the case follow-up, paper design, and bibliographic research.

Ethical aspects

The patient verbally agreed to this publication after being given full disclosure, and anonymity was guaranteed.

Acknowledgment

I owe a great deal of gratitude to my esteemed professors for inspiring me to finish this research project. I appreciate the assistance provided by Dr. Priyanka patil and Dr. vinod. I want to express my gratitude for the unwavering assistance of Dr. sithara and Dr. Aishwarya, as well as for their pertinent suggestions that I used to complete this review article.

References

1. Hananel, N., & Gordon, P. H. (1997). Re-examination of clinical manifestations and response to therapy of fissure-in-ano. *Diseases of the Colon & Rectum*, 40(2), 229–233.
2. Lockhart-Mummery, J. P. (1934). *Diseases of the Rectum and Colon and Their Surgical Treatment*. Baillere.
3. Abcarian, H., Lakshmanan, S., Read, D. R., & Roccaforte, P. (1982). The role of internal sphincter in chronic anal fissures. *Diseases of the Colon & Rectum*, 25(6), 525–528.
4. Farouk, R., Duthie, G. S., MacGregor, A. B., & Bartolo, D. C. C. (1994). Sustained internal sphincter hypertonia in patients with chronic anal fissure. *Diseases of the Colon & Rectum*, 37(5), 424–429.
5. Lund, J. N., & Scholefield, J. H. (1996). Aetiology and treatment of anal fissure. *British Journal of Surgery*, 83(10), 1335–1344.
6. Jenkins, J. T., Urie, A., & Molloy, R. G. (2008). Anterior anal fissures are associated with occult sphincter injury and abnormal sphincter function. *Colorectal Disease*, 10(3), 280–285.

7. Sauper, T., Lanthaler, M., Biebl, M., Weiss, H., & Nehoda, H. (2007). Impaired anal sphincter function in professional cyclists. *Wiener Klinische Wochenschrift*, *119*(5–6), 170–173.
8. Garg, P. (2010). Water stream in a bidet-toilet as a cause of anterior fissure-in-ano: a preliminary report. *Colorectal Disease*, *12*(6), 601–602.
9. Nzimbala, M. J., & Bruyninx, L. (2007). Chronic anal fissure from suspected adult sexual abuse in a traumatic anal sex practice patient. *Acta Chirurgica Belgica*, *107*(5), 566–569.
10. Nothmann, B. J., & Schuster, M. M. (1974). Internal anal sphincter derangement with anal fissures. *Gastroenterology*, *67*(2), 216–220.
11. Delgado, D. A., Lambert, B. S., Boutris, N., McCulloch, P. C., Robbins, A. B., Moreno, M. R., & Harris, J. D. (2018). Validation of Digital Visual Analog Scale Pain Scoring With a Traditional Paper-based Visual Analog Scale in Adults. *Journal of the American Academy of Orthopaedic Surgeons. Global Research & Reviews*, *2*(3), e088. doi: 10.5435/JAAOSGlobal-D-17-00088.
12. Orkin, B. A., Sinykin, S. B., & Lloyd, P. C. (2010). The digital rectal examination scoring system (DRESS). *Diseases of the Colon & Rectum*, *53*(12), 1656-1660. doi: 10.1007/DCR.0b013e3181f23c85.
13. Conde Montero, E. (2016). PRP in wound healing. In R. Alves & R. Grimalt (Eds.), *Clinical Indications and Treatment Protocols with Platelet-Rich Plasma in Dermatology* (pp. 59–72). Ediciones Mayo.
14. Schlichtemeier, S., & Engel, A. (2016). Anal fissure. *Australian Prescriber*, *39*(1), 14-17. doi: 10.18773/austprescr.2016.007.
15. Sclafani, A. P., & McCormick, S. A. (2012). Induction of dermal collagenesis, angiogenesis, and adipogenesis in human skin by injection of platelet-rich fibrin matrix. *Archives of Facial Plastic Surgery*, *14*, 132–136.
16. Bou Camps, L. (2016). PRP in cosmetic dermatology. In R. Alves & R. Grimalt (Eds.), *Clinical Indications and Treatment Protocols with Platelet-Rich Plasma in Dermatology* (pp. 45–57). Ediciones Mayo.
17. Xu, P., Wu, Y., Zhou, L., Yang, Z., Zhang, X., Hu, X., ... Cheng, B. (2020). Platelet-rich plasma accelerates skin wound healing by promoting re-epithelialization. *Burns & Trauma*, *8*, tkaa028. doi: 10.1093/burnst/tkaa028.
18. Alves, R., & Grimalt, R. (2018). A Review of Platelet-Rich Plasma: History, Biology, Mechanism of Action, and Classification. *Skin Appendage Disorders*, *4*(1), 18-24. doi: 10.1159/000477353.
19. Theml, H. (2004). Physiology and pathophysiology of blood cells. In H. Theml, H. Diem, & T. Haferlach (Eds.), *Color Atlas of Hematology* (Thieme: Stuttgart).
20. Alves, R., & Grimalt, R. (2018). A Review of Platelet-Rich Plasma: History, Biology, Mechanism of Action, and Classification. *Skin Appendage Disorders*, *4*(1), 18-24. doi: 10.1159/000477353.