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Title of Article- Comparative Evaluation of Novabone Putty In Combination With Platelet Rich Fibrin (PRF) And Platelet Rich Fibrin (PRF) Alone In The Treatment of Human Infrabony Defects– A Randomized Clinical Trial

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Abstract--- *Periodontitis is chronic inflammatory disease leads to loss of supporting structures of the teeth results in exfoliation of teeth.(1, 2) Treatment of these periodontal condition is mandatory. Previously, decreasing the disease advancement considered as utmost treatment protocol by preserving the lost periodontal structures.(3,4)*

Keywords--- *Infrabony defects, Novabone putty, Platelet rich fibrin, Periodontal regeneration*

I INTRODUCTION:

Deep periodontal defects cause difficulty in eliminating disease tissue. To eliminate, it may require periodontal surgery also for regeneration of lost periodontal tissues. Diversity found in bonegraft materials such as autografts, allografts, xenografts, and synthetic materials.[5,6] Alloplast characterized as they are synthetically originate, harmless and inorganic substitute. Alloplast does not require second surgical.[7,8] These bonegraft regenerate periodontal tissues through osteoinductive or osteoconductive pathways.

Previously, Bioactive glasses used as alloplast materials for periodontal regeneration.[9,10] NovaBone Dental putty (Calcium phosphosilicate putty) is a new, next generation calcium phosphosilicate(CPS) bone graft material. It is premixed made up of bioactive calcium phosphosilicate particulate along with absorbable binder. It consist of polyethylene glycol (PEG)and glycerin. It is delivered in ready to use form which is available in single use syringe and allows holding the material easily. [11-14]

Fibrin products extensively used in dentistry as treatment modality which imitates the natural coagulation cascade in which fibrinogen converts to fibrin through activation of thrombin.[15] This network fibrin helps to

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coaggregate platelets at the injury site, where formation of platelet plug occur to achieve hemostasis. And also it release growth factors and cytokines to initiate healing.[16,17]

Choukroun's given Platelet Rich Fibrin contains concenterated platelet.[18] It consist of glycanic chains, cytokines and structural glycoproteins. PRF is rich in leukocyte.[19-21] During formation and centrifugation process it forms 3 layers in test tube: Platelet poor plasma (PPP) at the topmost portion , PRF clot found in centre, and Red blood cells (RBC) at the base of test tube. After completion of centrifugation process get removed out serum into fibrin membrane.[22] It is 3D membrane which consist of platelets and growth factors.[23,24] It is autologous, easy to handle and safe for treatment protocol. [25] It has potential to release variety of growth factors at healing site for longer period.[27,28] PRF has potential to release some growth factors at equal concentration for a period of seven days. [29]

Thus, the aim of present randomized parallel clinical trial is whether combination of Novabone Putty with PRF and PRF alone effective in the treatment of human infrabony defects ?

II OBJECTIVES :

- To determine the efficacy of Novabone Putty in combination with platelet rich fibrin with respect to CAL gain, PPD reduction and radiographic bone fill in infrabony defects.
- To determine the efficacy of PRF in terms of CAL gain, PPD reduction and radiographic bone fill.
- To compare the efficacy of Novabone Putty in combination with PRF and PRF alone and in terms of gain in CAL, decrease in PPD and radiographic bone fill in infra-bony defects.

III STUDY POPULATION

24 patients having moderate to advanced chronic periodontitis with clinical and radiographic findings of angular defects will be chosen from the outpatient Department Of Periodontics, Sharad Pawar Dental College, Sawangi (Meghe), Wardha using following criteria.

IV INCLUSION CRITERIA:

- Patient should not be systemically comprimised.
- Presence of minimum 1 or 2 interproximal infrabony osseous defect with PPD ≥ 5 mm and CAL ≥ 5 mm following initial therapy and which are radiographically noticeable.
- Depth of intraosseous defect component ≥ 3 mm by clinical and radiographic means, which will be accepted through intrasurgical measurement
- A radiographically determined defect base should be minimum of 3 mm above terminal end portion of root of tooth.
- Presence of minimum ≥ 2 mm zone of keratinized gingiva surrounds the test teeth which allows full soft tissue coverage at defect site.

V EXCLUSION CRITERIA:

- Presence of localized aggressive periodontitis.
- Patients with poor oral hygiene care (Plaque Index >1)
- Patient who smokes (with recent history of smoking more than 10 cigarettes /day) or who consume any type of tobacco products.
- Study tooth with improper endodontic / restorative therapy.
- Study tooth with mobility exceeding grade II and exhibiting a class III or class IV furcation defect.
- Previous History of periodontal surgery in selected quandrant selected for study purpose.
- Pregnant females or lactating mothers.
- Clinically determined and/or radiographic examined untreated acute infection present at selected area.
- Presence of apical pathology, cemental pearls, root irregularities and fracture which causes difficulty in removal through odontoplasty process, untreated decayed tooth at cementoenamel junction or at root surface.

Information related to dietary status, oral hygiene care, systemic background, gingival and periodontal condition details will be documented precisely in charts. Clinical evaluation of patients will be done through mouth mirror and William's graduated periodontal probe in good illumination.

VI INITIAL THERAPY:

In first visit, full mouth scaling will be undertaken followed by root planing under local anesthesia if required.[30] Coronoplasty will be carried out and oral hygiene instructions will be given to patient. Plaque control measures will be repeated until plaque score will be ≤ 1. After initial therapy, periodontal evaluation will be carried out once in 2 week.

The information about the need of study will be clarified and signed informed consent will be taken from patients. Study protocol will be first approved by Ethical committee of DMIMS (IEC/2018-19/7493), Sawangi (Meghe), Wardha.

For the Standardization of probe angulations and accurate position, custom made occlusal acrylic stent will be made. Alginate impression will be taken for cast model preparation on which occlusal stent will be fabricated through use of acrylic material. Stent should cover the occlusal surface of test tooth and extend to minimum one adjacent tooth and covers the coronal third of teeth. A reference point (slot) will be marked on the stent at the deepest site of involved tooth to facilitate reproducible periodontal probe positions. The apical margin will be linear and served as a fixed reference point.

VII STUDY DESIGN:

After initial therapy 24 patients who are systemically healthy will be selected. It is double blinded study. Before undergoing surgical treatment, the choosen infrabony defects were allocated randomly. Groups will be divided into

test and control which consist 12 defects in each. The test group will be treated by combination of Novabone Putty and platelet rich fibrin (PRF), while the control group will be treated by platelet rich fibrin (PRF) alone.

VIII CLINICAL MEASUREMENTS:

Clinical measurements like Plaque index, Papillary bleeding index, Probing pocket depth, Relative attachment level and Relative gingival marginal level will be recorded at the day of surgery & postoperatively at 3 and 6 months. Primary outcomes will be radiographic bone fill and Secondary outcomes will be PI, PBI, CAL gain, PPD reduction. Also, periodontal charting on specially designed form, intraoral periapical radiographs and intraoral clinical photographs will be obtained.

Oral health status of patient will be examined by using plaque index which will represent the accumulation of plaque present above the gingival margin of teeth. Gingival inflammation will be measured through Papillary bleeding index.

VIII.I. Indices

- Plaque Index (PI) (Turesky – Gillmore –Glickman Modification of Quigley-Hein 1970)31
- Papillary Bleeding Index (Muhlemann H.R 1977)32

VIII.II. Probing Measurements:

Both treatment groups will be recorded to measure probing pocket depth (PPD), relative clinical attachment level (R-CAL), relative gingival marginal level (RGML at six site of the selected defect: mesiobuccal, mesiolingual, midmesial of one tooth, and distobuccal, distolingual, middistal of adjacent tooth. Only one deepest measurement per defect will be taken into consideration for calculation of the result through UNC-15 calibrated periodontal probe. These clinical parameters will be measured at the day of surgery, post operatively at 3 & 6 months.

The UNC-15 probe will be placed in the slot made on the acrylic stent and tip at the gingival marginal level and the measurement will be determined upto lower border of stent as relative gingival margin level (RGML). Placement of probe will be placed at the base of the pocket and the distance upto the lowest border of stent will be considered as a relative attachment level (RAL). Probing pocket depth will be measured from base of the pocket upto gingival margin (PPD).

The width of keratinized gingiva will be recorded by measuring the sulcular depth and attached gingiva (from mucogingival junction upto free gingival groove) through UNC-15 calibrated Periodontal Probe. All the probing measurements will record at baseline, after 3 and 6 months of surgery.

VIII.III. Radiographic analysis:

Intra oral periapical radiograph (IOPA) xray will be choosen of selected area. The x-ray taken through by parallel technique with long cone at day of surgery and 6 month post surgical period. Radiographic measurements will be taken through a film mounted with grid scale. On grid scale, lines are at intervals of 1mm and bold lines at 5 mm.

Distance of CEJ upto base of defect will be obtained through radiographic measurement with use of developed IOPA.

$$\%BF = \frac{\text{CEJ to base of defect(Baseline) - CEJ to base of defect(6 months)}}{\text{Original defect depth (Crest of the bone to base of defect)}} \times 100$$

IX SURGICAL PROCEDURE:

Before surgical treatment, patients will be advised to swish with 0.2 % chlorhexidine gluconate mouthwash for about 1-2 minute. Under all aseptic precaution and condition, nerve block will be given with local anaesthetic solution of 2% xylocaine [33] containing 1:1,00,000 epinephrine.

IX.I. Flap Design (Incisions):

Use of Bard-Parker number 12 or 15 surgical blades to achieve predictable reflection of defect site. For reflection of flap intracrevicular incision given on buccal and lingual aspects. To achieve primary wound closure and to preserve complete interdental papillae, the incisions should be given as far interproximally as possible. To achieve added exposure, vertical releasing incisions will be placed on a adjacent tooth.

IX.II. Flap reflection:

To gain access to alveolar bone in area of bone defect, periosteal elevator (24G Hu-Friedy, USA) is used by raising the full thickness flap. A thorough debridement of defect will be carried out by removing diseased tissue from undersurface of the flap and at the same time, proper measures should be taken to prevent the flap rupturing or papillae loss.

IX.III. Debridement and root surface management:

Debridement of osseous defect will be initially done manually with scalers and curretes (Gracey curettes, Hu-Friedy, USA) followed by power driven scalers. The undersurface of the flap or papillae will be debrided judiciously to prevent over trimming the flap. Root surfaces will be planned with hand instruments.

Depth of the vertical bone defects (BD) will be measured. The total osseous wall present will be recorded with UNC15 probe. All osseous defects measuring ≥ 3 mm vertically will be included in the study. Intra marrow penetration of the base of the defect through use of half round bur will ensure sufficient bleeding from the site.

IX.IV. PRF Preparation

A standard protocol will be followed for the preparation of PRF. Before the placement of PRF about 5ml blood drawn intravenously. Collection of blood will be done in sterile test tube without any added anticoagulant. After placement of test tube in centrifugation machine, centrifuged it for 10 min at 3000 rpm. This ensures fibrin clot formation at the centre of test tube. Sterile tweezers and scissors will be used to separate the PRF from red corpuscular base. It will then be compressed to squeeze out the serum and obtain a fibrin membrane.

IX.V. Procedure for test group:

Following prior isolation and achievement of haemostasis, the flap will be pre- sutured to facilitate faster flap approximation. Novabone Putty mixed with PRF will be placed into the osseous defect in test site with light pressure till it filled up to coronal most level of osseous wall by raising the flap and then PRFs will be extend over the defect as a membrane. The PRF membrane will be adapted in such a way that it covers at least 3mm beyond the osseous defect. The flap will be coronally repositioned and sutured in such a way that the flap margin will be located 1 to 2 mm coronal to CEJ, ensuring primary flap closure. A combination of vertical mattress suture and interproximal suture will be used to secure the flap in position. Slight pressure will be applied to the area with saline-soaked gauze for approximately 2 minutes, to adapt the soft tissue well to the tooth surface and eliminate any space in which a clot might form and disrupt re-attachment. This procedure will be followed by placement of a periodontal dressing.

IX.VI. Procedure for control group:

The procedure at the control site will be identical to the procedure of test site except osseous defects at control sites will be packed with Plasma rich fibrin(PRF) of the required size and other PRFs will be used to cover the defect as a membrane.

IX.VII. Post-operative care:

Post operative medications will be prescribed which includes antibiotics analgesics for 5 days. Patients will be advised to swish with 0.2% chlorhexidine mouthwash for about 6 weeks.[34] Removal of Periodontal dressing and sutures will be done at 8-10 days after the surgery. Use of tooth brushing or chewing will be not allowed for 6 weeks in the treated area. Patients will be informed to cleanse the operated area in an apico-coronal direction with cotton pellet dip in 0.12 % chlorhexidine for additional 2-3 weeks. After that oral hygiene measures like brushing and interdental cleaning aids will be reinstructed to stop use of that and also resume the use of this chlorhexidine mouthwash.

IX.VIII. Maintenance care:

Patients will be followed at 1, 3, 6 months post surgically. Oral hygiene care given to patient at every visit along with ultrasonic scaling. Care will be taken not to probe upto 6 month after surgery.

IX.IX. Re-examination:

A complete post operative evaluation will be performed at 6 months post-surgically. All clinical parameters and measurements will be re-assessed. In addition standardized radiographs will be obtained after 6 month.

IX.X. Statistical Analysis:

PBI, PI and clinical parameters like RAL, PPD, WKG and GR will be assessed by calculation of means and standard deviation (Mean ± SD) values. Student's paired t-test will be applied to each treatment group from baseline to 6 months. Student's unpaired t test will be used for comparisons between both treatment groups at baseline level

and 6 months follow up period. If the probability value (p) > 0.05 then, difference found will be non-significant and if < 0.05, it will be considered significant.

X EXPECTED RESULTS:

Novabone Putty in combination with Platelet rich fibrin (PRF) is superior compared to Platelet rich fibrin (PRF) alone in the treatment of Human Infrabony Defects.

XI DISCUSSION:

Periodontitis is chronic inflammatory disease leads to loss of supporting structures of the teeth and resulting in exfoliation of teeth. Treatment of these periodontal condition is mandatory which includes preserving the lost periodontal structures. Deep periodontal defects cause difficulty in eliminating disease tissue and calls for the need of periodontal surgery for regeneration of lost periodontal tissues. This study will facilitate the outcomes of using Novabone Putty in combination with Platelet rich fibrin (PRF) compared to Platelet rich fibrin (PRF) alone in the treatment of Human Infrabony Defects. A number of studies related to the factors involved in this trial were reviewed [(36-75)].

REFERENCES

[1] Pihlstrom BL, Michalowicz BS, Johnson NW. Periodontal diseases. Lancet 2005;366:1809- 1820
[2] Ghangurde AA, Ganji KK, Bhongade ML, Sehdev B. Role of chemically modified tetracyclines in the management of periodontal diseases: a review. Drug research. 2017 May;67(05):258-65.
[3] Hengmesh Khosropanah,Shoaleh Shahidi, Amar Basri,Maral Houshyar.Treatment of Intrabony defects by DFDBA alone or in combination with PRP: A split mouth randomized clinical and three dimensional radiographic trial October 2015; Vol. 12, No. 10
[4] Mukherjee P, Patel A, Chandak M, Kashikar R. Minimally Invasive Endodontics a Promising Future Concept: A Review Article. INTERNATIONAL JOURNAL OF SCIENTIFIC STUDY. 2017 Apr 1;5(1):245-51.
[5] Froum S, Cho SC, Rosenberg E, Rohrer M, Tarnow D.Histological comparison of healing extraction sockets implanted with bioactive glass or demineralized freeze-dried bone allograft:A pilot study. J Periodontol 2002;73:94-102.
[6] Borle R, Nimonkar P, Hingnikar P, Khatib MN, Gaidhane AM, Zahiruddin QS. Efficacy and safety of different interpositional flaps and grafts for closing fibrotomy wound in patients of oral submucosal fibrosis: A systematic review with meta-analysis. Medical Science. 2019;23(100):1031-48.
[7] Hench LL, Wilson J. Surface-active biomaterials. Science1984;226:630-6.
[8] Wilson J, Noletti D. Bonding of soft tissues to Bio glass. In:Handbook of Bioactive Ceramics: Bioactive Glasses and Glass Ceramics. Vol. 1. Florida: CRC Press; 1990
[9] Zamet JS, Darbar UR, Griffiths GS, Bulman JS, Brägger U,Bürgin W, et al. Particulate bioglass as a grafting material in the treatment of periodontal intrabony defects. J Clin Periodontol1997;24:410-8.
[10] Nevins ML, Camelo M, Nevins M, King CJ, Oringer RJ,Schenk RK, et al. Human histologic evaluation of bioactive ceramic in the treatment of periodontal osseous defects. Int J Periodontics Restorative Dent 2000;20:458-67.
[11] Grover V, Kapoor A, Malhotra R, Uppal RS. Evaluation of theefficacy of a bioactive synthetic graft material in the treatmentof intrabony periodontal defects. J Indian Soc Periodontol2013;17:104-10.
[12] Shukla S, Chug A, Mahesh L, Grover HS. Effect of addition ofplatelet-rich plasma to calcium phosphosilicate putty on healingat 9 months in periodontal intrabony defects. J Contemp DentPract 2016;17:230-4.
[13] Panchbhai A. Nanotechnology in dentistry. InApplications of Nanocomposite Materials in Dentistry 2019 Jan 1 (pp. 191-203). Woodhead Publishing.
[14] Panchbhai A. Nanocomposites: Past, present, and future of dentistry. InApplications of Nanocomposite Materials in Dentistry 2019 Jan 1 (pp. 181-190). Woodhead Publishing.

[15] Schwartz Z, Mellonig JT, Carnes DL Jr, et al. Ability of commercial demineralized freeze-dried bone allograft to induce new bone formation. J Periodontol 1996; 67:918-926.
[16] Dohan DM, Choukroun J, Diss A, et al. Platelet-rich fibrin (PRF): a second-generation platelet concentrate. Part I: technological concepts and evolution. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2006;101:E37-E44.
[17] Agrawal I, Chandran S, Nadig P. Comparative evaluation of the efficacy of platelet-rich fibrin and calcium phosphosilicate putty alone and in combination in the treatment of intrabony defects: A randomized clinical and radiographic study. Contemp Clin Dent 2017;8:205-10.
[18] Dohan DM, Choukroun J, Diss A, et al. Platelet-richfibrin (PRF): A second-generation platelet concentrate.Part I: Technological concepts and evolution.Oral Surg Oral Med Oral Pathol Oral Radiol Endod2006;101:e37-e44.
[19] Dohan Ehrenfest DM, Rasmusson L, Albrektsson T.Classification of platelet concentrates: From pure platelet-rich plasma (P-PRP) to leucocyte- and platelet-rich fibrin (L-PRF). Trends Biotechnol 2009;27:158-167.
[20] Dohan DM, Choukroun J, Diss A, et al. Platelet-rich fibrin (PRF): A second-generation platelet concentrate.Part III: Leucocyte activation: A new feature for platelet concentrates? Oral Surg Oral Med Oral Pathol Oral Radio Endod 2006;101:e51-e55.
[21] Dohan DM, Choukroun J, Diss A, et al. Platelet-rich fibrin (PRF): A second-generation platelet concentrate.Part II: Platelet-related biologic features. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2006; 101:e45-e50.
[22] Dhote VS, Thosar NR, Baliga SM, Dharnadhikari P, Bhatiya P, Fulzele P. Surgical management of large radicular cyst associated with mandibular deciduous molar using platelet-rich fibrin augmentation: A rare case report. Contemporary clinical dentistry. 2017 Oct;8(4):647.
[23] Kamble AT, Kamble MK, Abhishek P. A comparative study on wound healing using Placentrex, collagen, vitamin C and insulin. JOURNAL OF EVOLUTION OF MEDICAL AND DENTAL SCIENCES-JEMDS. 2017 Apr 10;6(29):2366-71.
[24] Dohan Ehrenfest DM, Del Corso M, Diss A, Mouhyi J, Charrier JB. Three-dimensional architecture and cell composition of a Choukroun's platelet-rich fibrin clot and membrane. J Periodontol 2010; 81:546-555.
[25] Hotwani K, Sharma K. Assessment of the impact of colors on child's anxiety and treatment preference for local anesthesia injections. Journal of advanced oral research. 2017 May;8(1-2):42-6.
[26] Sharma A, Pradeep AR. Treatment of 3-wall intrabony defects in patients with chronic periodontitis with autologous platelet-rich fibrin: A randomized controlled clinical trial. Journal of periodontology. 2011 Dec;82(12):1705-12.
[27] Dohan DM, Choukroun J, Diss A, Dohan SL, Dohan AJ,Mouhyi J, et al. Platelet-rich fibrin (PRF): A second-generationplatelet concentrate. Part I: Technological concepts andevolution. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2006;101:e37-44
[28] Dohan DM, Choukroun J, Diss A, Dohan SL, Dohan AJ,Mouhyi J, et al. Platelet-rich fibrin (PRF): A second-generationplatelet concentrate. Part II: Platelet-related biologicfeatures. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2006;101:e45-50
[29] Sharma T. Wound healing activity of certain root drugs-A review from classical and ethnomedicinal claims. International Journal of Green Pharmacy (IJGP). 2019 Mar 9;13(01).
[30] Dambhare A, Bhongade ML, Dhadse PV, Sehdev B, Ganji KK, Thakare K, Murakami H, Sugita Y, Maeda H, Alam MK. A Randomized Controlled Clinical Study of Autologous Platelet Rich Fibrin (PRF) in Combination with HA and Beta-TCP or HA and Beta-TCP Alone for Treatment of Furcation Defects. Journal of Hard Tissue Biology. 2019;28(2):185-90.
[31] *Turesky S, Gilmore, Glickman : Reduced plaque formation by the chloromethyl analogue of vit C. J Periodontol 1970;41:41-49.*
[32] *Muhlemann. HR: Psychological and chemical mediators of gingival health. J Prevodent 1977;4:6-17*
[33] Gantasala BV, Singam A, Taksande K. Bupivacaine (0.5%) Versus (0.5%) Bupivacaine with Ketamine (50 mg) for Subarachnoid Block in Lower Abdominal Surgeries: A Randomised Comparative Study. Journal of Clinical & Diagnostic Research. 2019 Mar 1;13(3).
[34] Akkaoui S, keltoum Ennibi O. Use of traditional plants in management of halitosis in a Moroccan population. Journal of intercultural ethnopharmacology. 2017 Jul;6(3):267.
[35] Nandanwar, J., M. Bhongade, S. Puri, P. Dhadse, M. Datir, and A. Kasatwar. "Comparison of Effectiveness of Hyaluronic Acid in Combination with Polylactic Acid/Polyglycolic Acid Membrane and Subepithelial Connective Tissue Graft for the Treatment of Multiple Gingival Recession Defects in Human: A Clinical Study." *Journal of Datta Meghe Institute of Medical Sciences University* 13, no. 1 (2018): 48–53. https://doi.org/10.4103/jdmimsu.jdmimsu_39_18.

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[36] Oswal, N., M. Chandak, R. Oswal, and M. Saoji. "Management of Endodontically Treated Teeth with Endocrown." *Journal of Datta Meghe Institute of Medical Sciences University* 13, no. 1 (2018): 60–62. https://doi.org/10.4103/jdmimsu.jdmimsu_38_17.
[37] Pal, S., R.M. Oswal, and G.K. Vankar. "Recognition of Major Depressive Disorder and Its Correlates among Adult Male Patients in Primary Care." *Archives of Psychiatry and Psychotherapy* 20, no. 3 (2018): 55–62. https://doi.org/10.12740/APP/89963.
[38] Papalkar, P., S. Kumar, S. Agrawal, N. Raisinghani, G. Marfani, and A. Mishra. "Heterotaxy Syndrome Presenting as Severe Pulmonary Artery Hypertension in a Young Old Female: Case Report." *Journal of Gerontology and Geriatrics* 66, no. 2 (2018): 59–61.
[39] Parlani, S., S. Tripathi, and A. Bhoyar. "A Cross-Sectional Study to Explore the Reasons to Visit a Quack for Prosthodontic Solutions." *Journal of Indian Prosthodontist Society* 18, no. 3 (2018): 231–38. https://doi.org/10.4103/jips.jips-24-18.
[40] Patel, T.V., M.J. Brahmbhatt, and G.K. Vankar. "Prevalence of Alcohol Use Disorders in Hospitalised Male Patients." *Archives of Psychiatry and Psychotherapy* 20, no. 4 (2018): 47–55. https://doi.org/10.12740/APP/99147.
[41] Patil, S., R. Ranka, M. Chaudhary, A. Hande, and P. Sharma. "Prevalence of Dental Caries and Gingivitis among Pregnant and Nonpregnant Women." *Journal of Datta Meghe Institute of Medical Sciences University* 13, no. 1 (2018): 44–47. https://doi.org/10.4103/jdmimsu.jdmimsu_5_18.
[42] Phatak, S., and G. Marfani. "Galactocele Ultrasonography and Elastography Imaging with Pathological Correlation." *Journal of Datta Meghe Institute of Medical Sciences University* 13, no. 1 (2018): 1–3. https://doi.org/10.4103/jdmimsu.jdmimsu_51_18.
[43] Rajan, R., S. Gosavi, V. Dhakate, and S. Ninave. "A Comparative Study of Equipotent Doses of Intrathecal Clonidine and Dexmedetomidine on Characteristics of Bupivacaine Spinal Anesthesia." *Journal of Datta Meghe Institute of Medical Sciences University* 13, no. 1 (2018): 4–8. https://doi.org/10.4103/jdmimsu.jdmimsu_59_18.
[44] Rajan, R., S.N. Gosavi, V. Dhakate, and S. Ninave. "A Comparative Study of Equipotent Doses of Intrathecal Clonidine and Dexmedetomidine on Characteristics of Bupivacaine Spinal Anesthesia." *Journal of Datta Meghe Institute of Medical Sciences University* 13, no. 1 (2018): 4–8. https://doi.org/10.4103/jdmimsu.jdmimsu.
[45] Ransing, R., S. Patil, K. Pevekar, K. Mishra, and B. Patil. "Unrecognized Prevalence of Macrocytosis among the Patients with First Episode of Psychosis and Depression." *Indian Journal of Psychological Medicine* 40, no. 1 (2018): 68–73. https://doi.org/10.4103/IJPSYM.IJPSYM_139_17.
[46] Rathi, A., R.S. Ransing, K.K. Mishra, and N. Narula. "Quality of Sleep among Medical Students: Relationship with Personality Traits." *Journal of Clinical and Diagnostic Research* 12, no. 9 (2018): VC01–4. https://doi.org/10.7860/JCDR/2018/24685.12025.
[47] Rathi, N., M. Chandak, and G. Mude. "Comparative Evaluation of Dentinal Caries in Restored Cavity Prepared by Galvanic and Sintered Burs." *Contemporary Clinical Dentistry* 9, no. 5 (2018): S23–27. https://doi.org/10.4103/ccd.ccd_801_17.
[48] Rawlani, S.M., R. Bhowate, S. Kashikar, M. Khubchandani, S. Rawlani, and R. Chandak. "Morphological Evaluation of Temporo-Mandibular Joint in Indian Population." *Brazilian Dental Science* 21, no. 1 (2018): 44–53. https://doi.org/10.14295/bds.2018.v21i1.1488.
[49] Samad, S., and S. Phatak. "Bilateral Axillary Accessory Breast with Ductal Ectasia: Ultrasonography and Elastographic Appearance." *Journal of Datta Meghe Institute of Medical Sciences University* 13, no. 4 (2018): 206–8. https://doi.org/10.4103/jdmimsu.jdmimsu_54_18.
[50] Samad, S.A., and S.V. Phatak. "An Unusual Case of Abdominoscrotal Swelling in a Young Patient-Hydrocele En Bissac." *Journal of Clinical and Diagnostic Research* 12, no. 11 (2018). https://doi.org/10.7860/JCDR/2018/37640.12278.
[51] Sarode, R.D., and V.D. Tendolkar. "Psychological Pain as Predictor of Impulse Control among BAMS New Entrants: A Correlation Study." *Journal of Datta Meghe Institute of Medical Sciences University* 13, no. 4 (2018): 171–74. https://doi.org/10.4103/jdmimsu.jdmimsu_26_19.
[52] Sarode, S.C., M. Chaudhary, A. Gadbail, S. Tekade, S. Patil, and G.S. Sarode. "Dysplastic Features Relevant to Malignant Transformation in Atrophic Epithelium of Oral Submucous Fibrosis: A Preliminary Study." *Journal of Oral Pathology and Medicine* 47, no. 4 (2018): 410–16. https://doi.org/10.1111/jop.12699.
[53] Sharma, P., M. Gawande, M. Chaudhary, and R. Ranka. "T-Cell Lymphoma of Oral Cavity: A Rare Entity." *Journal of Oral and Maxillofacial Pathology* 22, no. 1 (2018): 104–7. https://doi.org/10.4103/jomfp.JOMFP_153_16.

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[54] Sharma, S., A.D. Singh, S.K. Sharma, M. Tripathi, C.J. Das, and R. Kumar. "Gallium-68 DOTA-NOC PET/CT as an Alternate Predictor of Disease Activity in Sarcoidosis." *Nuclear Medicine Communications* 39, no. 8 (2018): 768–78. https://doi.org/10.1097/MNM.0000000000000869.

[55] Sharma, S.K., A. Mohan, A.D. Singh, H. Mishra, S. Jhanjee, R.M. Pandey, B.K. Singh, et al. "Impact of Nicotine Replacement Therapy as an Adjunct to Anti-Tuberculosis Treatment and Behaviour Change Counselling in Newly Diagnosed Pulmonary Tuberculosis Patients: An Open-Label, Randomised Controlled Trial." *Scientific Reports* 8, no. 1 (2018). https://doi.org/10.1038/s41598-018-26990-5.

[56] Shilpa, B., S. Vasudevan, M. Bhongade, V. Baliga, V. Pakhare, and P. Dhadse. "Evaluation of Survival of 8 Mm-Length Implants in Posterior Resorbed Ridges: A Pilot Study." *Journal of Indian Society of Periodontology* 22, no. 4 (2018): 334–39. https://doi.org/10.4103/jisp.jisp_368_17.

[57] Singh, B.S., P.G. Jaiswal, P.V. Dhadse, A.A. Agrawal, and V.V. Pakhare. "Uncommon Presentation of Inflammatory Gingival Enlargement: Resolution by Means of Nonsurgical Periodontal Therapy Only." *Journal of Datta Meghe Institute of Medical Sciences University* 13, no. 2 (2018): 104–7. https://doi.org/10.4103/jdmimsu.jdmimsu_26_18.

[58] Singh, P., S. Jain, D. Methwani, S. Kalambe, D. Chandravanshi, S. Gaurkar, and P.T. Deshmukh. "Study of Correlation of Pre-Operative Findings with Intra-Operative Ossicular Status in Patients with Chronic Otitis Media." *Iranian Journal of Otorhinolaryngology* 30, no. 5 (2018): 273–81. https://doi.org/10.22038/ijorl.2018.26795.1875.

[59] Srivastava, T.K., V. Mishra, and L.S. Waghmare. "Formative Assessment Classroom Techniques (FACts) for Better Learning in Pre-Clinical Medical Education: A Controlled Trial." *Journal of Clinical and Diagnostic Research* 12, no. 9 (2018): JC01–8. https://doi.org/10.7860/JCDR/2018/35622.11969.

[60] Sthapak, E., U. Gajbe, and B.R. Singh. "Study of Communication between Musculocutaneous and Median Nerves in Man." *Journal of the Anatomical Society of India* 67 (2018): S37–44. https://doi.org/10.1016/j.jasi.2018.05.005.

[61] Swarnkar, M., and A. Agrawal. "Kimura's Disease." *Formosan Journal of Surgery* 51, no. 1 (2018): 26–28. https://doi.org/10.4103/fjs.fjs_56_17.

[62] Swarnkar, M., and P. Pandey. "Heterotopic Subserosal Pancreatic Tissue in Jejunum." *Formosan Journal of Surgery* 51, no. 4 (2018): 167–70. https://doi.org/10.4103/fjs.fjs_88_17.

[63] Tripathi, A., A. Avasthi, S. Grover, E. Sharma, B.M. Lakdawala, M. Thirunavukarasu, A. Dan, et al. "Gender Differences in Obsessive-Compulsive Disorder: Findings from a Multicentric Study from Northern India." *Asian Journal of Psychiatry* 37 (2018): 3–9. https://doi.org/10.1016/j.ajp.2018.07.022.

[64] Vyas, R., S.R. Suchitra, P.T. Gaikwad, V. Gurumurthy, S. Arora, and S. Shetty. "Assessment of Fracture Resistance Capacity of Different Core Materials with Porcelain Fused to Metal Crown: An in Vitro Study." *Journal of Contemporary Dental Practice* 19, no. 4 (2018): 389–92. https://doi.org/10.5005/jp-journals-10024-2271.

[65] Agarwal, A., N. Bhola, R. Kambala, and R.M. Borle. "Touch Imprint Cytology: Can It Serve as an Alternative to Frozen Section in Intraoperative Assessment of Cervical Metastasis in Oral Squamous Cell Carcinoma?" *Journal of Oral and Maxillofacial Surgery* 77, no. 5 (2019): 994–99. https://doi.org/10.1016/j.joms.2019.01.011.

[66] Aglawe, P.B., R.K. Jha, V. Mishra, K.M. Sakore, A. Chetan, and D.S. Shrivastava. "Appraisal of Core Therapy, Supportive Therapy, and Alternative Therapy in a Tertiary Care Rural Hospital of Vidarbha Region in Correlation to Plethora of Menopausal Problems." *Journal of Mid-Life Health* 10, no. 1 (2019): 14–21. https://doi.org/10.4103/jmh.JMH-131-18.

[67] Agrawal, D., A.S. Bhake, N. Rastogi, S. Laishram, A. Wankhade, and A. Agarwal. "Role of Bethesda System for Reporting Thyroid Lesion and Its Correlation with Histopathological Diagnosis." *Journal of Datta Meghe Institute of Medical Sciences University* 14, no. 2 (2019): 74–81. https://doi.org/10.4103/jdmimsu.jdmimsu_76_18.

[68] Agrawal, M., N. Acharya, K. Joshi, and D. Shrivastava. "Effectiveness of Isosorbide Mononitrate in Cervical Ripening before Induction of Labor in Full-Term Antenatal Patients." *Journal of SAFOG* 11, no. 2 (2019): 96–99. https://doi.org/10.5005/jp-journals-10006-1668.

[69] Aryal, N., P.R. Regmi, E. van Teijlingen, P. Simkhada, and P. Mahat. "Adolescents Left behind by Migrant Workers: A Call for Community-Based Mental Health Interventions in Nepal." *WHO South-East Asia Journal of Public Health* 8, no. 1 (2019): 38–41. https://doi.org/10.4103/2224-3151.255348.

[70] Bajaj, A., S. Kumar, A.H. Inamdar, and L. Agrawal. "Noninvasive Ventilation in Acute Hypoxic Respiratory Failure in Medical Intensive Care Unit: A Study in Rural Medical College." *International Journal of Critical Illness and Injury Science* 9, no. 1 (2019): 36–42. https://doi.org/10.4103/IJCIIS.IJCIIS_40_18.

[71] Baliga, M. "Artificial Intelligence-The next Frontier in Pediatric Dentistry." *Journal of Indian Society of Pedodontics and Preventive Dentistry* 37, no. 4 (2019): 315. https://doi.org/10.4103/JISPPD.JISPPD_319_19.
[72] Baliga, S. "It's Time for Creative Solutions: Collaborations." *Journal of Indian Society of Pedodontics and Preventive Dentistry* 37, no. 3 (2019): 223. https://doi.org/10.4103/JISPPD.JISPPD_284_19.
[73] Baliga, S.M. "Child Oral Health-Care Literacy in India: Can Access to Services Be Improved?" *Journal of the Indian Society of Pedodontics and Preventive Dentistry* 37, no. 1 (2019): 1–2. https://doi.org/10.4103/JISPPD.JISPPD_18_19.
[74] Borle, R.M., A. Jadhav, N. Bhola, P. Hingnikar, and P. Gaikwad. "Borle's Triangle: A Reliable Anatomical Landmark for Ease of Identification of Facial Nerve Trunk during Parotidectomy." *Journal of Oral Biology and Craniofacial Research* 9, no. 1 (2019): 33–36. https://doi.org/10.1016/j.jobcr.2018.08.004.
[75] Jagati, A., R. Chaudhary, S. Rathod, B. Madke, K. Baxi, and D. Kasundra. "Preparation of Platelet-Rich Fibrin Membrane over Scaffold of Collagen Sheet, Its Advantages over Compression Method: A Novel and Simple Technique." *Journal of Cutaneous and Aesthetic Surgery* 12, no. 3 (2019): 174–78. https://doi.org/10.4103/2543-1854.267617.
[76] Kumar, G. K., & Prasad, R. S. (2019). A non-linear kernel feature subset selection based semi-supervised framework for medical disease prediction. International Journal of Advanced Science and Technology, 28(17), 517-526. Retrieved from www.scopus.com
[77] Kumar, R., Pruthi, M., & Taneja, G. (2019). Inventory model for deteriorating products with life time and demand depending on price. International Journal of Advanced Science and Technology, 27(1), 48-52. Retrieved from www.scopus.com
[78] Kumar, S., & Bathla, R. K. (2019). Multimodal approach with face and iris to enhance the efficiency of biometric system using soft biometrics. International Journal of Advanced Science and Technology, 28(16), 1572-1581. Retrieved from www.scopus.com
[79] Lakshmi, P., Bharadwaj, A., & Kumar Srivastava, R. (2019). Microbial profile of bacteriuria in pregnant women and their antibiogram. International Journal of Advanced Science and Technology, 28(14), 337-344. Retrieved from www.scopus.com
[80] Lee, S. -., Choi, A. -., Kim, S. -., Won, J. -., & Lee, K. -. (2019). Comparison of EMG activity using spectrum indices from biceps femoris muscle during treadmill walking. International Journal of Advanced Science and Technology, 28(3), 33-39. Retrieved from www.scopus.com

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