
Simple interrupted vs figure of eight suturing in open method extraction

KAUSALYAH KRISNA MALAY¹, BALAKRISHNAN R.N^{2*}, JAYANTH KUMAR.V³

¹Saveetha Dental College And Hospitals, Saveetha Institute Of Medical And Technical Sciences, Saveetha University, Chennai, India

²Senior Lecturer, Department of Oral Surgery, Saveetha Dental College And Hospitals, Saveetha Institute Of Medical And Technical Sciences, Saveetha University, Chennai, India

³Reader, Department of Oral Medicine, Saveetha Dental College And Hospitals, Saveetha Institute Of Medical And Technical Sciences, Saveetha University, Chennai, India

*Corresponding Author

Email ID: 151301085.sdc@saveetha.com¹, balakrishnan.sdc@saveetha.com, jayanthkumar@saveetha.com

Abstract: Development of infections along the line of the incision is potentially a dangerous postoperative event. However, some infections that affect the wound margins in certain areas of the body may put the prognosis, in terms of the patient's life, at risk. In less dramatic situations they in case delay healing of tissues involved in transalveolar extraction. The suturing techniques used to reconstruct the planes for primary healing. To evaluate the prevalence of simple interrupted sutures and figure of eight sutures in transalveolar extraction. To analyse the use of simple interrupts and figure of eight sutures. The study was conducted as a hospital based case control study in the area of Thiruverkadu, Chennai. The study was carried out by collecting data by reviewing patients data and analysing the data of 86000 patients between June 2019 and March 2020 at the private dental institute. A total number of 326 case sheets were taken for the study after reviewing from intraoral photographs and additional supports. Photographs were accessed to determine the suturing techniques for patients that underwent open method extraction. Pearson Chi Square Test was evaluated using SPSS. Results were recorded. Simple interrupted suture was commonly used compared to figure of eight suture in transalveolar extraction in the private dental college. Majority of the dental students placed simple interrupted sutures compared to figure of eight sutures postoperative to open method extractions.

Keywords: extraction; figure of eight; open method; simple interrupted; suture; transalveolar

INTRODUCTION

The importance of soft tissue management is an absolute priority today in any intra and extra -oral surgical procedure if a good esthetic and functional result is to be achieved. There are at least two aspects that are of equal importance in reaching this goal. On the other hand, the design and consequent management of an open method extraction, and the suturing technique.(Jesudasan, Abdul Wahab and Muthu Sekhar, 2015) The development of infections along the line of the incision is potentially a dangerous postoperative event. Some infections that affect the wound margins in certain areas of the body may put the prognosis, in terms of the patient's life, at risk. In less dramatic situations they in case delay healing of tissues involved in extraction (open method).(Mp and Rahman, 2017)

The suturing techniques used to reconstruct the planes can thus have a direct and determinate influence on the phases of healing, making an in depth and detailed knowledge of the physical, chemical and technology properties of suturing materials an absolute necessity. The clinical choice that, on each individual occasion, leads us to prefer a synthetic or a natural thread, a single or a multiple filament, a resorbable or a non- resorbable suture, must be reasoned and never left to chance.(Christabel *et al.*, 2016) Moreover, the surgical suture, isolating the healing centre, promotes the cicatrization process, controls the haemostasis, stabilizes the tissues on the requested position, has an external contamination and also improves the patient comfort.(Marimuthu *et al.*, 2018)

The wound's suture has an old origin, the first description was found in a sixteenth century B.C. papyrus.(Packiri, Gurunathan and Selvarasu, 2017) They are works of the Greek doctors Hypocrates, the first traumatology texts that expounded the necessary rules after the treatment and for the wounds suture. The problem to take in examination on the post - operative course, because it represents the main cause of surgical wound healing delay.(Mp, 2017) The simple interrupted suture provides some protection against the possibility.(Patil *et al.*, 2017) Rather than using a single strand to pull the wound edges closed, simple

interrupted sutures consist of multiple stitches placed close together, (Rao and Santhosh Kumar, 2018) which distributes tension more evenly across the length of the wound site and helps to keep the tissue edges from coming apart even if one suture breaks. (Abhinav *et al.*, 2019)

However, simple interrupted sutures are among the most commonly used techniques in wound closure of post transalveolar extraction. This is because they offer a number of advantages over a continuous running stitch. They are easier to place since they consist of only a single, shorter strand. This is valuable in the event of infection, which may require the wound to be cleaned or drained of fluid. (Santhosh Kumar and Sneha, 2016) Unfortunately, some of the unique characteristics can also create complications. Each suture must be tied off with its own knot. If the knot is not tied off correctly, it could cause damage to the surrounding tissues or lead to infections. Since each suture must be carefully placed along the wound edges, closing a laceration with simple interrupted sutures can often be quite time - consuming. (Kumar, 2017)

Advantages of using a figure of eight suturing technique are known to be that it is removable. Traditional subcutaneous sutures cannot be removed and must be resorbable. In other words, it must be made of material that can be absorbed by the oral tissue enzymes. (Kumar and Rahman, 2017) In addition, it allows closure of two layers simultaneously when compared with the interrupted sutures. Ischemia at the edges is a reduction in the blood supply to the supply of body tissues. (Patturaja and Pradeep, 2016) Being removable, one avoids burying material in depth of the tissue, minimizing the chances of developing stitch differences or related complications. The technique enables any length difference between flaps and to be evened up when sutured. It also helps in minimizing the dog's ear defects. (Jain, Muthusekhar and Baig, 2019)

However, this technique also has disadvantages. The major disadvantage is that this technique is more difficult to master and this technique is sensitive compared to interrupted sutures. Moreover, patients experience slightly more discomfort on suture removal compared to interrupted sutures. Every suturing technique has its own pros and cons. In present study, the sutures were chosen based on the usage of sutures in open method extraction and the comparison was done. (Sweta, Abhinav and Ramesh, 2019) Our team has rich experience in research and we have collaborated with numerous authors over various topics in the past decade (Deogade, Gupta and Ariga, 2018; Ezhilarasan, 2018; Ezhilarasan, Sokal and Najimi, 2018; Jeevanandan and Govindaraju, 2018; J *et al.*, 2018; Menon *et al.*, 2018; Prabakar *et al.*, 2018; Rajeshkumar *et al.*, 2018, 2019; Vishnu Prasad *et al.*, 2018; Wahab *et al.*, 2018; Dua *et al.*, 2019; Duraisamy *et al.*, 2019; Ezhilarasan, Apoorva and Ashok Vardhan, 2019; Gheena and Ezhilarasan, 2019; Malli Sureshbabu *et al.*, 2019; Mehta *et al.*, 2019; Panchal, Jeevanandan and Subramanian, 2019; Rajendran *et al.*, 2019; Ramakrishnan, Dhanalakshmi and Subramanian, 2019; Sharma *et al.*, 2019; Varghese, Ramesh and Veeraiyan, 2019; Gomathi *et al.*, 2020; Samuel, Acharya and Rao, 2020) Therefore, the aim of this study is to compare the use of simple interrupted and figure of eight suture techniques postoperative to open method extraction in a private dental institute.

MATERIALS AND METHODS

The study was conducted as a hospital based case control study in the area of Thiruverkadu, Chennai. Data was collected from the record management software called DIAS of a private dental institute. From 21st June 2019 till 21st March 2020. A total number of 326 case sheets were reviewed from intraoral photographs and additional supports. Photographs were accessed to determine the suturing techniques for patients that underwent open method extraction. The study was evaluated and approved by the ethical committee of the private dental institute. The inclusion and exclusion criteria were decided as following:

- Inclusion criteria
 - patients underwent open method extractions
 - individual aged above 17 years old
- Exclusion criteria
 - patients below 17 years old
 - incomplete available data
 - improper photographs

Suturing type was evaluated from analyzing post operative intraoral photographs from DIAS. Those collective data was entered into Microsoft Excel with the parameters as following:

- PID Number
- Patient name
- Gender
- Age
- Type of suture

The mentioned data were coded accordingly and transferred into statistical analysis software. A comparison test, Pearson Chi Square association test was done between simple interrupted suture and figure of eight suture post open method extractions. The sutures were placed by dental students on the site of extraction. The results were recorded. The differences considered positively significant as the p value was less than 0.05.

RESULTS AND DISCUSSION

According to figure 1, the gender distribution showed the majority of males have undergone open method extractions. There were 146 male patients(55.9%) and 115 female patients(44.1%) who underwent extraction using this method. This showed male patients were predominant in undergoing open method extractions.

In figure 2, the suture types of techniques given by dental students to patients showed only 3 students have given figure of eight suturing for their patients post open extraction, which is only 1.1%. About 258 patients had simple interrupted suturing post open method extraction.

Figure 3 showed that the most number of extraction with open method was done in tooth number 48 and followed by 28. This showed the open method extraction was done in mostly lower third molars. Finally, the most number of simple interrupted suture was placed in 38 and another in 28. Rest of the tooth was given a simple interrupted suturing, as shown in figure 4

The statistical result for this study showed that p value was 0.592. Therefore, statistically the difference was not significant as the p value is more than 0.05. Statistical analysis using SPSS 2.0 (IBM 2019) PC version for Windows was done and found to be not significant.(Pearson Chi Square Test; $p > 0.05$ - not significant)

In a similar study conducted by Acar et al,(Acar *et al.*, 2017) revealed that simple interrupted sutures were used as conventional suturing in oral cavity tissues. This study was similar to the present study. The statistical analysis also showed similar results where the p value was more than 0.05 (not significant).

Another study, Wu et al,(Wu, 2006) showed that the simple interrupted suture is most commonly used after any oral surgical procedures, including transalveolar extractions. This suture was believed to promote wound eversion and reduce the tension across the wound edges.

In current study, the mean age of a patient was 40 years old. The most common tooth involved was 48. The statistics was positively significant between simple interrupted and figure of eight suturing in an open method extraction. So many previous literatures showed that simple interrupted suture was wisely used in the majority of extraction cases. It was known to be the easiest suture technique among most of the dentists and especially dental students.

The association between simple interrupted and figure of eight suturing in open method extraction is that the importance of sutures are to enhance the socket healing. The possibility of simply interrupted suture to be the majority of choice could be because of the operators skill and knowledge.

However, the consensus of this study is disagreed due to the limitations of this study. The limitations are smaller sample size, limited geographic, single ethnic group, single centered and unicentric study.

In future scope, larger sample size with multi centered study has to be conducted. The dental students should be provided with clinical assessment on baseline of sutures in an open method extraction. The students should improve the way of providing wound closure with many other suturing techniques.Our institution is passionate about high quality evidence based research and has excelled in various fields ((Pc, Marimuthu and Devadoss, 2018; Ramesh *et al.*, 2018; Ezhilarasan, Apoorva and Ashok Vardhan, 2019; Ramadurai *et al.*, 2019; Sridharan *et al.*, 2019; Vijayashree Priyadharsini, 2019; Mathew *et al.*, 2020)

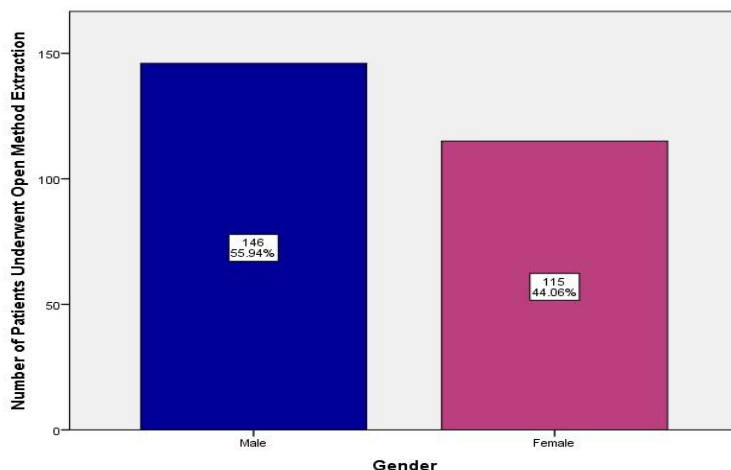


Fig.1: The graph shows gender distribution of patients undergoing open method extraction to a private dental institute. X-axis represents the genders of patients undergoing an open method extraction and Y-axis represents the frequency of patients had extraction by open method. The graph explains that male patients were predominant compared to female patients who underwent open method extraction.

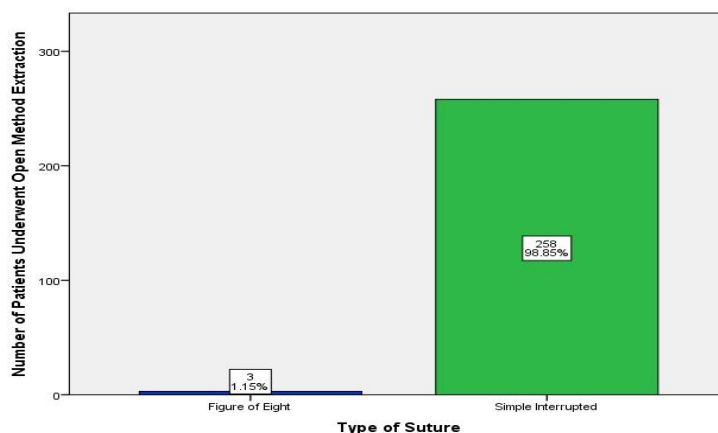


Fig.2: The graph explains the frequency of suture type used in post operative open method extraction. X-axis represents the type of suture used post open method extraction procedure and Y-axis represents the number of patients underwent open method extraction. The graph portrays there is a more number of simple interrupted sutures were placed compared to figure of eight sutures.

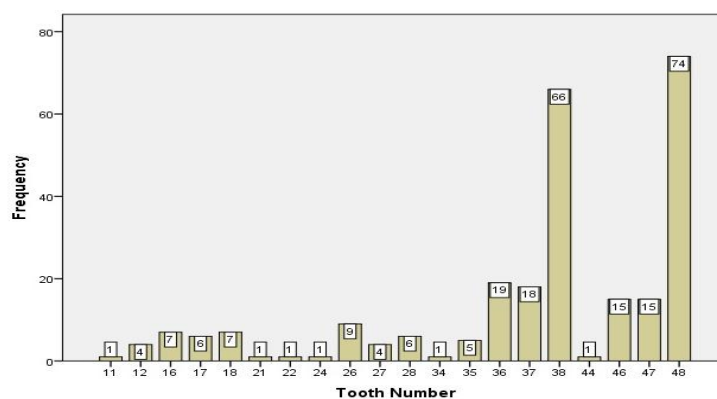


Fig.3: Bar graph showed the frequency of tooth number involved in open method extraction. The graph explains that the highest number (74 patients) of tooth numbers undergone open method extraction was 48 which denotes the lower third molar.

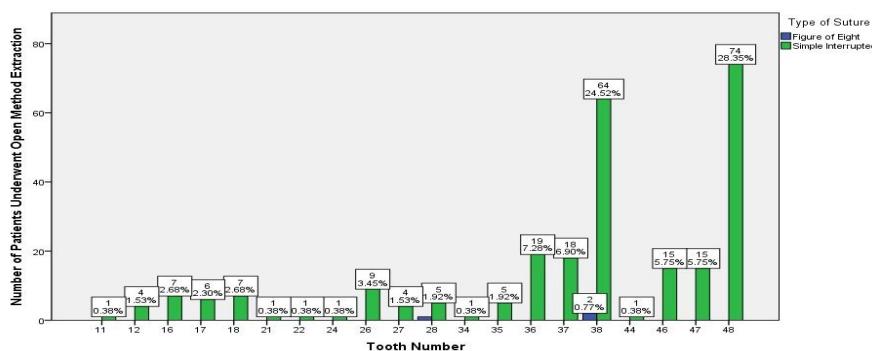


Fig.4: The bar graph depicting the association between the tooth number and type of sutures present post-operative procedure of open method extraction. X axis represents the tooth number involved in open method extraction and Y axis represents the number of patients underwent open method extraction. The graph explains that simple interrupted sutures were placed in relation to 48 the most whereas figure of eight suture seen most in tooth number 38 (Pearson Chi Square Value - 16.968; df=19; p= 0.592 (p>0.05)) not significant. Hence no association between the type suturing technique and the tooth number can be established.

CONCLUSION

Within the limitations of this present study, the majority of the dental students placed simple interrupted sutures compared to the figure of eight sutures postoperative to open method extraction.

ACKNOWLEDGEMENT

The authors of this study acknowledge the institute, for their help towards collecting all the patient case records and other datas in relevance to the current study.

AUTHOR CONTRIBUTIONS

- Design - Kausalyah Krisna Malay, Balakrishnan
- Intellectual content - Balakrishnan
- Data collection - Kausalyah Krisna Malay
- Data analysis - Balakrishnan, Jayanth Kumar
- Manuscript writing - Kausalyah Krisna Malay
- Manuscript editing - Balakrishnan, Jayanth Kumar

CONFLICT OF INTEREST

The authors declare that there were no conflict of interest

REFERENCES

1. Abhinav, R. P. *et al.* (2019) 'The Patterns and Etiology of Maxillofacial Trauma in South India', *Annals of maxillofacial surgery*, 9(1), pp. 114–117.
2. Acar, A. H. *et al.* (2017) 'Is Horizontal Mattress Suturing More Effective Than Simple Interrupted Suturing on Postoperative Complications and Primary Wound Healing After Impacted Mandibular Third Molar Surgery?', *The Journal of craniofacial surgery*, 28(7), pp. e657–e661.
3. Christabel, A. *et al.* (2016) 'Comparison of pterygomaxillary dysjunction with tuberosity separation in isolated Le Fort I osteotomies: a prospective, multi-centre, triple-blind, randomized controlled trial', *International Journal of Oral and Maxillofacial Surgery*, pp. 180–185. doi: 10.1016/j.ijom.2015.07.021.
4. Deogade, S., Gupta, P. and Ariga, P. (2018) 'Effect of monopoly-coating agent on the surface roughness of a tissue conditioner subjected to cleansing and disinfection: A Contact Profilometric In vitro study', *Contemporary Clinical Dentistry*, p. 122. doi: 10.4103/ccd.ccd_112_18.
5. Dua, K. *et al.* (2019) 'The potential of siRNA based drug delivery in respiratory disorders: Recent advances and progress', *Drug development research*, 80(6), pp. 714–730.
6. Duraisamy, R. *et al.* (2019) 'Compatibility of Nonoriginal Abutments With Implants: Evaluation of Microgap at the Implant-Abutment Interface, With Original and Nonoriginal Abutments', *Implant dentistry*, 28(3), pp. 289–295.
7. Ezhilarasan, D. (2018) 'Oxidative stress is bane in chronic liver diseases: Clinical and experimental perspective', *Arab journal of gastroenterology: the official publication of the Pan-Arab Association of Gastroenterology*, 19(2), pp. 56–64.
8. Ezhilarasan, D., Apoorva, V. S. and Ashok Vardhan, N. (2019) 'Syzygium cumini extract induced reactive oxygen species-mediated apoptosis in human oral squamous carcinoma cells', *Journal of oral pathology & medicine: official publication of the International Association of Oral Pathologists and the American Academy of Oral Pathology*, 48(2), pp. 115–121.
9. Ezhilarasan, D., Sokal, E. and Najimi, M. (2018) 'Hepatic fibrosis: It is time to go with hepatic stellate cell-specific therapeutic targets', *Hepatobiliary & pancreatic diseases international: HBPD INT*, 17(3), pp. 192–197.
10. Gheena, S. and Ezhilarasan, D. (2019) 'Synergic acid triggers reactive oxygen species-mediated cytotoxicity in HepG2 cells', *Human & experimental toxicology*, 38(6), pp. 694–702.
11. Gomathi, A. C. *et al.* (2020) 'Anticancer activity of silver nanoparticles synthesized using aqueous fruit shell extract of Tamarindus indica on MCF-7 human breast cancer cell line', *Journal of Drug Delivery Science and Technology*, p. 101376. doi: 10.1016/j.jddst.2019.101376.
12. Jain, S. V., Muthusekhar, M. R. and Baig, M. F. (2019) 'Evaluation of three-dimensional changes in pharyngeal airway following isolated lefort one osteotomy for the correction of vertical maxillary excess: a prospective ...', *Journal of maxillofacial*. Available at: <https://link.springer.com/article/10.1007/s12663-018-1113-4>.
13. Jeevanandan, G. and Govindaraju, L. (2018) 'Clinical comparison of Kedo-S paediatric rotary files vs manual instrumentation for root canal preparation in primary molars: a double blinded randomised clinical trial', *European Archives of Paediatric Dentistry*, pp. 273–278. doi: 10.1007/s40368-018-0356-6.
14. Jesudasan, J. S., Abdul Wahab, P. U. and Muthu Sekhar, M. R. (2015) 'Effectiveness of 0.2% chlorhexidine gel and a eugenol-based paste on postoperative alveolar osteitis in patients having third molars extracted: a randomised controlled clinical trial', *British Journal of Oral and Maxillofacial Surgery*, pp. 826–830. doi: 10.1016/j.bjoms.2015.06.022.
15. J, P. C. *et al.* (2018) 'Prevalence and measurement of anterior loop of the mandibular canal using CBCT: A cross sectional study', *Clinical implant dentistry and related research*, 20(4), pp. 531–534.

16. Kumar, S. (2017) 'THE EMERGING ROLE OF BOTULINUM TOXIN IN THE TREATMENT OF OROFACIAL DISORDERS: LITERATURE UPDATE', *Asian Journal of Pharmaceutical and Clinical Research*, p. 21. doi: 10.22159/ajpcr.2017.v10i9.16914.
17. Kumar, S. and Rahman, R. (2017) 'KNOWLEDGE, AWARENESS, AND PRACTICES REGARDING BIOMEDICAL WASTE MANAGEMENT AMONG UNDERGRADUATE DENTAL STUDENTS', *Asian Journal of Pharmaceutical and Clinical Research*, p. 341. doi: 10.22159/ajpcr.2017.v10i8.19101.
18. Malli Sureshbabu, N. et al. (2019) 'Concentrated Growth Factors as an Ingenious Biomaterial in Regeneration of Bony Defects after Periapical Surgery: A Report of Two Cases', *Case reports in dentistry*, 2019, p. 7046203.
19. Marimuthu, M. et al. (2018) 'Canonical Wnt pathway gene expression and their clinical correlation in oral squamous cell carcinoma', *Indian journal of dental research: official publication of Indian Society for Dental Research*, 29(3), pp. 291–297.
20. Mathew, M. G. et al. (2020) 'Evaluation of adhesion of Streptococcus mutans, plaque accumulation on zirconia and stainless steel crowns, and surrounding gingival inflammation in primary ...', *Clinical oral investigations*. Available at: <https://link.springer.com/article/10.1007/s00784-020-03204-9>.
21. Mehta, M. et al. (2019) 'Oligonucleotide therapy: An emerging focus area for drug delivery in chronic inflammatory respiratory diseases', *Chemico-biological interactions*, 308, pp. 206–215.
22. Menon, S. et al. (2018) 'Selenium nanoparticles: A potent chemotherapeutic agent and an elucidation of its mechanism', *Colloids and Surfaces B: Biointerfaces*, pp. 280–292. doi: 10.1016/j.colsurfb.2018.06.006.
23. Mp, S. K. (2017) 'Relationship between dental anxiety and pain experience during dental extractions', *Asian J Pharm Clin Res*. Available at: <https://pdfs.semanticscholar.org/f024/7b95077e4a0bb861eb9b8b815893f19758d6.pdf>.
24. Mp, S. K. and Rahman, R. (2017) 'Knowledge, awareness, and practices regarding biomedical waste management among undergraduate dental students', *Asian J Pharm Clin Res*. Available at: <https://innovareacademics.org/journals/index.php/ajpcr/article/download/19101/12066>.
25. Packiri, S., Gurunathan, D. and Selvarasu, K. (2017) 'Management of Paediatric Oral Ranula: A Systematic Review', *Journal of clinical and diagnostic research: JCDR*, 11(9), pp. ZE06–ZE09.
26. Panchal, V., Jeevanandan, G. and Subramanian, E. M. G. (2019) 'Comparison of post-operative pain after root canal instrumentation with hand K-files, H-files and rotary Kedo-S files in primary teeth: a randomised clinical trial', *European archives of paediatric dentistry: official journal of the European Academy of Paediatric Dentistry*, 20(5), pp. 467–472.
27. Patil, S. B. et al. (2017) 'Comparison of Extended Nasolabial Flap Versus Buccal Fat Pad Graft in the Surgical Management of Oral Submucous Fibrosis: A Prospective Pilot Study', *Journal of maxillofacial and oral surgery*, 16(3), pp. 312–321.
28. Patturaja, K. and Pradeep, D. (2016) 'Awareness of Basic Dental Procedure among General Population', *Journal of pharmacy research*. Available at: <http://www.indianjournals.com/ijor.aspx?target=ijor:rjpt&volume=9&issue=9&article=010>.
29. Pc, J., Marimuthu, T. and Devadoss, P. (2018) 'Prevalence and measurement of anterior loop of the mandibular canal using CBCT: A cross sectional study', *Clinical implant dentistry and related research*. Available at: <https://europepmc.org/article/med/29624863>.
30. Prabakar, J. et al. (2018) 'Comparative Evaluation of Retention, Cariostatic Effect and Discoloration of Conventional and Hydrophilic Sealants - A Single Blinded Randomized Split Mouth Clinical Trial', *Contemporary clinical dentistry*, 9(Suppl 2), pp. S233–S239.
31. Rajendran, R. et al. (2019) 'Comparative Evaluation of Remineralizing Potential of a Paste Containing Bioactive Glass and a Topical Cream Containing Casein Phosphopeptide-Amorphous Calcium Phosphate: An in Vitro Study', *Pesquisa Brasileira em Odontopediatria e Clínica Integrada*, pp. 1–10. doi: 10.4034/pboci.2019.191.61.
32. Rajeshkumar, S. et al. (2018) 'Biosynthesis of zinc oxide nanoparticles using Mangifera indica leaves and evaluation of their antioxidant and cytotoxic properties in lung cancer (A549) cells', *Enzyme and microbial technology*, 117, pp. 91–95.
33. Rajeshkumar, S. et al. (2019) 'Antibacterial and antioxidant potential of biosynthesized copper nanoparticles mediated through Cissus arnotiana plant extract', *Journal of photochemistry and photobiology. B, Biology*, 197, p. 111531.
34. Ramadurai, N. et al. (2019) 'Effectiveness of 2% Articaine as an anesthetic agent in children: randomized controlled trial', *Clinical oral investigations*, 23(9), pp. 3543–3550.
35. Ramakrishnan, M., Dhanalakshmi, R. and Subramanian, E. M. G. (2019) 'Survival rate of different fixed posterior space maintainers used in Paediatric Dentistry - A systematic review', *The Saudi dental journal*, 31(2), pp. 165–172.
36. Ramesh, A. et al. (2018) 'Comparative estimation of sulfiredoxin levels between chronic periodontitis and healthy patients - A case-control study', *Journal of periodontology*, 89(10), pp. 1241–1248.

37. Rao, T. D. and Santhosh Kumar, M. P. (2018) 'Analgesic Efficacy of Paracetamol Vs Ketorolac after Dental Extractions', *Research Journal of Pharmacy and Technology*, p. 3375. doi: 10.5958/0974-360x.2018.00621.2.
38. Samuel, S. R., Acharya, S. and Rao, J. C. (2020) 'School Interventions-based Prevention of Early-Childhood Caries among 3-5-year-old children from very low socioeconomic status: Two-year randomized trial', *Journal of public health dentistry*, 80(1), pp. 51–60.
39. Santhosh Kumar, M. P. and Sneha, S. (2016) 'Knowledge and awareness regarding antibiotics prophylaxis form for infective endocarditis among under graduate dental students', *Asian J Pharm Clin Res*.
40. Sharma, P. et al. (2019) 'Emerging trends in the novel drug delivery approaches for the treatment of lung cancer', *Chemico-biological interactions*, 309, p. 108720.
41. Sridharan, G. et al. (2019) 'Evaluation of salivary metabolomics in oral leukoplakia and oral squamous cell carcinoma', *Journal of oral pathology & medicine: official publication of the International Association of Oral Pathologists and the American Academy of Oral Pathology*, 48(4), pp. 299–306.
42. Sweta, V. R., Abhinav, R. P. and Ramesh, A. (2019) 'Role of Virtual Reality in Pain Perception of Patients Following the Administration of Local Anesthesia', *Annals of maxillofacial surgery*, 9(1), pp. 110–113.
43. Varghese, S. S., Ramesh, A. and Veeraiyan, D. N. (2019) 'Blended Module-Based Teaching in Biostatistics and Research Methodology: A Retrospective Study with Postgraduate Dental Students', *Journal of dental education*, 83(4), pp. 445–450.
44. Vijayashree Priyadharsini, J. (2019) 'In silico validation of the non-antibiotic drugs acetaminophen and ibuprofen as antibacterial agents against red complex pathogens', *Journal of periodontology*, 90(12), pp. 1441–1448.
45. Vishnu Prasad, S. et al. (2018) 'Report on oral health status and treatment needs of 5-15 years old children with sensory deficits in Chennai, India', *Special care in dentistry: official publication of the American Association of Hospital Dentists, the Academy of Dentistry for the Handicapped, and the American Society for Geriatric Dentistry*, 38(1), pp. 58–59.
46. Wahab, P. U. A. et al. (2018) 'Scalpel Versus Diathermy in Wound Healing After Mucosal Incisions: A Split-Mouth Study', *Journal of oral and maxillofacial surgery: official journal of the American Association of Oral and Maxillofacial Surgeons*, 76(6), pp. 1160–1164.
47. Wu, T. (2006) 'Plastic surgery made easy - simple techniques for closing skin defects and improving cosmetic results', *Australian family physician*, 35(7), pp. 492–496.