SEMINAR ILMIAH INTERNASIONAL
IKATAN KONSERVASI GIGI INDONESIA

AEC 2016
ASEAN ENDODONTIC CONGRESS

INNA GRAND BALI BEACH, 18 - 19 NOVEMBER 2016

Getting to The Roots of Endodontic
Towards Asean Economic
Community

BUKU PROSIDING

SEKRETARIAT PANITIA
DEPARTEMEN ILMU KONSERVASI GIGI
FAKULTAS KEDOKTERAN GIGI
UNIVERSITAS MAHASARASWATI DENPASAR
Jl. Kamboja 11 A Denpasar
Telp (0361) 7462701 / (0361) 7424079
Email: aecbali16@gmail.com
PROSIDING

SEMINAR ILMIAH INTERNASIONAL
IKATAN KONSERVASI GIGI INDONESIA

ASEAN ENDODONTIC CONGRESS (AEC) 2016

"Getting to The Roots of Endodontic Towards ASEAN Economic Commumity"

Denpasar, 18-19 November 2016

Editor:

Dr. drg Dewa Made Wedagama, Sp.KG
Prof.Dr. drg. Latief Mooduto, MS., SpKG(K)

Drg M. Rulianto, MS., SpKG(K)

Dr. drg. Dian Agustin Widyuningrum, SpKG

Drg. drg. Ira Widjastuti, M.Kes., SpKG(K)


diterbitkan oleh:

PENGURUS PUSAT IKATAN KONSERVASI GIGI INDONESIA

(PP IKORGI)

2016
DAFTAR ISI

1. The effect of micro leakage in class V cavity using self adhering flowable composite with the addition of acid etch
   Dennis, Darwis Aswad dan Anastasia ........................................ 1-6

2. Hemisection and restoration as a treatment option: a case report
   Dhea Aditya dan Ruslan Effendy ............................................. 7-12

3. Apexitication on Right Upper Incisor Tooth with Periapical Lesions Suspect Radicular Cyst (Case Report)
   Diani Prisunata dan Rasyid Kridha Hilmawan ........................................ 13-18

4. Immature tooth management using mta and all Porcelain crown reinforced with fabricated fiber post
   Evy Tri Utami dan Pribadi Santosa ........................................... 19-27

5. Bioviabilitas Ekstrak Daun Mangrove (Sonneratia Alba) Terhadap Kultur Sel Fibroblast Cell Line BHK-21
   Arliya Gladys Tricia Charyadi, Aprilia, dan Widyastuti ................. 28-37

6. The Internal Bleaching Treatment With Walking Bleach Technique On Maxillary Left Central Incisor
   I Gede Astika Andha Yasa dan Rahmi Alma Farah Adang ....................... 38-45

7. Endodontic Surgical Treatment Of Root Canal Filler Material Extrusion: Case Report
   Harris Rahmadil dan Ratna Meidayawati ...................................... 46-50

8. Success Endodontic Treatment Of Post Pulp Mummification Molar With Narrow Canals by Sonic Irrigation Technique Endoactivator
   Hartani Putri Utami dan Laksmini Setyowati ................................. 51-58

9. The Effectiveness of Starfruit Leaves Extract (Averrhoa bilimbi L.) as Antibacterial Against Mix Bacteria of Root Canals.
   I Gusti Ketut Aruttolly ............................................................ 59-65

10. Management Of Separated File Instrument In Root Canal With Conventional Endodontic Treatment
    Ilmilda dan Dini Astrianto ......................................................... 66-73

11. Sitotoksinites ekstrak daun mangrove daruji (Alcantus theflolius) sebagai bahan irigasi sumber air
    Ratna Putri, Titi Agnita Cevanti dan Heun Sumakar ........................ 74-80

12. Management Of Periapical Cyst With Endodontic Surgery .................. 81-83

13. The Effectiveness of Endoactivator and Irrigation Solutions to Remove Root Canal Calcification of Geriatric Patients
    Waiyku Elia Probowati dan Tanara Yuanita .................................... 86-92
14. Penggunaan Pasuk Fiber Oval pada Gigi dengan Saluran Akar Berbentuk Oval yang Telah Dirawat Endodontik. Laporan Kasus
Wahyu Suci Dwiantihary ................................................................. 93-100
15. Effect of light curing cycle with a time gap on microleakage of class II bulk-fill composite restoration (in vitro)
Widi Prasetya, Angel ........................................................................ 101-107
16. Aesthetic rehabilitation of failed composite resin restoration in four maxillary incisors
Yogyi Hadinata W dan Ira Widjastuti ..................................................... 108-116
17. Apical Plug Dengan MTA Pada Gigi Inisiusus Seminalis Maksila Apes Terbuka
Irawati Siregar .................................................................................... 117-122
18. The Use of Removable Denture in Patients with Dementia
Kadek Wirayuni .................................................................................. 123-126
Kartika Kusumaningdi dan Moch. Mudjiono ........................................ 127-135
Linnga Restu Anandita dan Opik Taufik Hidayat ................................ 136-140
21. Pemulihan frekuensi periapical gusi molar kiri rahang bawah pada pasien SLE
Lipur Kurniawati dan Anggraini Margono ......................................... 141-148
22. Esthetic Rehabilitation on Maxillary Anterior teeth with Multiple Distalos
Mertha Rizky Puspita dan Karlina Samadi .......................................... 149-155
23. Antibacterial effect extract ethanol of coconut fiber (cocos nucifer. L) as medicament alternative in root canal in the case of endodontic flare-ups
Nicky Wijaya, Nivi Yanti dan Trimural Abidin .................................. 156-166
24. Clinical Management of Endodontic Retreatment
Mochamad Kennedy dan Trimuntri Abidin ...................................... 167-172
25. Mineral trioxide aggregate (MTA) substitutes apical plug inadequate anterior rachangat laporan kasus
Muhthinah Sinta dan Jumil Jekti Nogroho ....................................... 173-178
26. Replantation: Clinical Implications and Outcome of Dry Storage of Avulsed Teeth
Nivi Yanti .......................................................................................... 179-188
27. Identification Multiple Root Canals using SLOB Rule
   Ni Kadek Ari Astuti ............................................. 189-193.
28. Perawatan Endodontik gigi molar kedua rahang bawah pada pasien
dengan retak mulut tinggi
   Navita Shintarini dan Munayati Usman .................................. 194-199.
29. Esthetic Rehabilitation of Complicated Crown Fractures in Maxillary
   Incisors
   Profilina Shinta dan Edhis Arif Prasetyo ................................. 200-207.
30. Endodontic Management of Mandibular First Premolar with Vertucci
   Type V Canal Configuration: A Case Report
   Putri Yulindari .......................................................... 208-214.
31. External bleaching on discolored tooth: a case report
   Sarahlah Adlan dan Nurhayati Natcir ...................................... 215-218.
32. Penatalaksanaan Lesi Porapik Spontan dengan Pendekatan Terapi
   Endodontik: Non Bedah (Laporan Kasus)
   Salska Budi Nurina dan Irnaesly Satifil .................................. 219-226.
33. Management of Open Apex: A Case Report of Permanent Anterior
   Teeth
   Sri Eka Sari dan Aries Chandra Triaksa .................................. 227-233.
34. Penatalaksanaan pengambilan pesco reamer yang putus pada gigi:
   kelamin dengan teknik syringe tip and glue : laporan kasus
   Steven Wijaya dan Trinarra Abidin ........................................ 234-241.
35. Management of aesthetic problem and endodontic treatment on tooth
   fracture in maxillary incisors
   Sunniyah Harun Arief dan Adiarto Soetojo ................................ 242-248.
36. Perawatan saluran akar lesi endoperioklisis simoa tipe I pada gigi
   premolar pertama rahang bawah laporan kasus
   Teguh Santoso dan Nilakesuma Djauharie .................................. 249-249.
37. Stikokainasien ekstrak dasar mangrove danju (Acanthus ilicifolius)
   sebagai bahan irigasi saluran akar
   Ratna Puri, Titi Aguita Cevanti dan Ilenu Sumesar ..................... 250-250.
38. Fiber-Reinforced Direct Composite Restoration Pada Gigi Anterior
   (Laporan Kasus)
   Arnold Kyodo dan Opik Taolik Hidayat .................................. 251-256.
39. Perawatan Endodontik Non Bedah Pada Perforasi Farkasi Menggunakan
   Biozotone: Laporan Kasus
   Atri Mya Kalsi dan Nila Kesuma Djauharie ............................... 257-262.
40. Bedah Endodontik Selangat Alternatif Perawatan Pada Kasus Overfilling
   Material Pengisi Selangat Akar Lapisan Kasar
   Ayu Sundari dan Ratna Moeryawati ...................................................... 263-270

41. Pengangkatan Instrument Patah Menggunakan Instrument Endodontik
   Ultrazonek Pada Gigi Premolar Rauting Atas
   Britna Listiani dan Ratna Moeryawati .................................................. 271-277

42. Antibacterial effect of ethanol extract of the avocado seed (persea
   americana mill) As an alternative root canal irrigants against
   porphyromonas gingivalis (in vitro)
   Cut Nuriliza, Dennis dan Wihardani Saviiri ............................................ 278-287

43. Endodontic Retreatment of a Maxilla Second Premolar with two
   Separate Canals
   Dania Vergelina Patri dan M. Rulianto ................................................. 288-292

44. Treatment of periodontal tissue Due to the overhanging fillings of class II
   Dewi Faryani IGA .................................................................................. 293-299

45. Dealing with External Apical Root Resorption Associated with Trauma:
   from Occlusion: Brief Review and Case Report
   Dewi Inoyati Sugianta dan Kurniawati .................................................. 294-299

46. Perubahan Warna Gigi Setelah Perawatan Ortodontik
   Ayu Wuhadiari dan Munyati Usman ....................................................... 300-307

47. Perubahan Diketahui Dengan Microscopy Porak Putih, Lapisan Kasar
   Basri Imran dan Endang Suprastiti ......................................................... 308-312

48. The development of cocoon fibre waste as an alternative medication for
   application in endodontic treatment
   Elyda Nurulita, Nett Yanti dan Trimurni Abidin ...................................... 313-318

49. Extruded ion nickel from apical foramen during instrumentaion with
   various irrigant
   Eltika Oktavina dan Trimurni Abidin .................................................... 320-337

50. Endodontic microsurgery for radicular cyst management with
   combination of platelet rich fibrin (prf) and bone graft – a case report
   Emmanuella C. Unora dan Bambang Nursantoro ...................................... 333-337

51. When shrinkage is a problem, this restoration can be a choice: a case
   report
   Ertiana Surtome dan Christine A. Rovani ................................................. 345-351

52. Immature tooth management using nuts and all Porcelain crown
   reinforced with fabricated fiber post
   Evy Tri Utami dan Prihadi Santosa ....................................................... 352-361
53. 3-in-1 Treatment of Traumatized Tooth with Open Apex and Discoloration
Fadil Abdillah dan Nanis Zubaidah ........................................ 362-369.

54. Mineral Trioxide Aggregate as an Obturation Material in Horizontal Root Fracture

55. Treatment of root resorption using bioactive materials (a literature review)
Fitri Yunita Batubara dan rimurni Abidin ...................................... 379-386.

56. Correlation between education level of parents to the caries of first permanent molar in children
I Putu Indra Pranandana .................................................................. 387-387.

57. The effect of smoke inhalation ways towards smoker’s melanosis that detriments the aesthetics
Intan Kemaila Dewi ........................................................................ 388-388.

58. Perbedaan sintesis pasca serbuk terpang emas (Srechopur harnam) ukuran partikel miksir dan nano pada kulit sel fibroblas.
BPK-21
Bella Djanfar Rivi, Linda Rockyani dan Twi Aqni Cevanti …………….. 389-399.

59. Endodontic Management of Maxillary First Premolar with Verticall Type V Canal Configuration A Case Report
Patri Yulandari ............................................................................... 400-406.

60. Effect Of Tooth Bleaching Procedures In Achieving Optimal Tooth Shade, Brightness, And Enamel Hardness
Fitri Yunita Batubara, Reluhina Ginting dan Yendriwali ...................... 407-414.

61. Functional and Esthetic Management of Fractured Anterior Teeth caused by Dental Trauma
Keyn Pusenda Muljadi dan Latief Mooduto ....................................... 415-424.

62. Case Report: Mineral Trioxide Aggregate as an Apical Plug Material in Tooth with Open Apex
Risia Dini Marsa ............................................................................ 425-431.

63. Esthetic Rehabilitation of Multiple Cases in Maxillary Anterior Dentition
Rizki Fanny Aviandono dan Cecilia G.J. Lunnardhi ............................ 432-439.

64. Perawatan non-bodah gigi asistif rasilan atas dengan kista radikular: laporan kasus
Rizky Amalia dan Anggraini Margono ............................................ 440-447.
65. Perawatan lesi endo-perio concomitanci klas 2 pada molar pertama rahang atas melalui pendekatan non-bedah: laporan kasus
   Rondhiana Nurul Annisa dan Nita Kusuma Djanahrie ........................................ 448-456
66. Root Canal Treatment in Left Third Mandibular Molar with Curvature Using Niti Instrument (a Case Report)
   Rusdiana dan Muryati Usman .............................................................................. 457-463
67. Minimally invasive post core removal with ultrasonic device
   Sandy Ratna Asri dan Dini Aslanti ................................................................. 464-471
68. Chronic Periodontal Lesion Management With Non Surgical Endodontic
   Approach (Case Report)
   Saksia budi nurlita .......................................................................................... 472-479
69. Apicectomy in Management of Unerupted Maxillary Central Incisor
   With Labioangular Root Dilaceration
   Wundania Farahanny dan Trimuntri Abidin ................................................... 480-487
70. Indirek Veneer Porselen Pada Gigi Anterior Rahang Atas Dengan
   Hipoplasia Email : Laporan Kasus
   Andi Hermantini Ace dan Juni Jekti Nugroho .................................................. 488-493
71. Fluorosis Dental Treatment (Anterior Upper Jaw) with Porcelain Veneer
   (Indirect)
   Angga Anggaramo dan Niarwati Pribadi ....................................................... 494-501
72. Penggantian Beberapa Mahkota Metal Porselen untuk Mendapatkan
   Warna yang Lebih Natural
   Anis Dian Hartini dan Endang Suprastiti ......................................................... 502-507
73. Management of Crown Fracture and Multiple Dislocation on Maxillary
   Anterior Teeth
   Arif Sefiawan dan Ari Subiyasto .................................................................. 508-517
74. Bioaktivitas Elektak Dana Mangrove (Sonneratia Alba) Terhadap Kultur
   Sel Fibroblas Cell Line IMR-90
   Arilta Gladis Tricia Charyadie, Aprilia, dan Widyaustini ................................. 518-529
75. Restoration of esthetic complex case with direct composite veneers: A
   case report.
   Elfira Megasari dan Taufik Hidayat .............................................................. 530-536
76. The Radio Emtoralis Managing the endodontic treatments with
   magnification (microscope) and Endodontic tips - Case Reports
   Gary Wijaya dan Trimuntri Abidin ............................................................... 537-545
77. Endodontic Treatment During Pregnancy : Rationale And Consideration
   Andina Rizkiya Putri Kusuma, drg., SpKG ..................................................... 546-553
RETRIEVAL OF BROKEN FILE USING ENDODONTIC ULTRASONIC INSTRUMENT IN MAXILLARY PREMOLAR

Brinna Listiani¹, Ratna Meidyawati²

¹ Post Graduate Student of Conservative Dentistry Specialist, Faculty of Dentistry, Universitas Indonesia, Jakarta, Indonesia.

² Lecturer of Department Conservative Dentistry, Faculty of Dentistry, Universitas Indonesia, Jakarta, Indonesia.

E-mail korespondensi : justbrinna@gmail.com

ABSTRACT
During endodontic treatment, clinician may face endodontic procedural mishap such as broken files, which may complicate the treatment procedure. Obstruction in the root canal will blocks the canal cleaning and shaping process and increase the risk of contamination which can compromises the healing process. Retrieval of broken file in root canal without sacrificing much tooth structure remains a challenge. In this case report, 49 year old woman having endodontic retreatment in maxillary right premolar because inadequate obturation with 10 mm broken Hedstrom file on middle third of buccal root canal. The broken instrument was successfully removed from the root canal with the help of endodontic ultrasonic instrument and root visualization under operating microscope. Endodontic retreatment was completed following preparation and obturation of root canal to working length.

Keywords: broken instrument, ultrasonic, retrieval of broken instrument

INTRODUCTION
Broken instrument in the root canal procedure may block root canal treatment and affect the outcome of treatment. The incidence of breakage of root canal instruments range from 2% - 6% of the reported cases and 0.39% -5% in the case of retreatment endodontic care. The main cause of this is improper use, limitations of the physical properties of the instrument, inadequate access, the anatomy of the root canal, and the manufacturing defect.(1) During root canal treatment, the broken instrument will block access to the apical terminus and can irritate the periapical tissue if the instrument pushed out of the apical foramen. Fragment itself is always accompanied by bacteria and debris dentin and is regarded as a foreign body and can cause inflammatory reactions. In addition, the fragments in the root canal can impede the process of preparation and obturation of the root canal. These instruments usually are the type of file or reamer, Gates Glidden Drills Drill or Peeso, lentulo spiral paste fillers, instruments explorer or spreader gutta percha.(2)(3)
Currently, the broken instrument can be retrieved because of technological developments e.g., ultrasonic instrumentation and microtube delivery methods. Dental operating microscope helps the clinician to visualize the broken instrument. The combination of dental operating microscope and ultrasonic instruments or "microsonic" techniques increase possibility and safety when retrieving a broken instrument. Technique using ultrasonic techniques with the help of dental operating microscope to remove instrument show success full rate of 79.5% in clinical trials and 86.6% in laboratory experiments. (4)(5)

Endodontics Ultrasonic widely used to remove hard tissue in the pulp chamber, removal of silver cone or broken endodontic instruments with many optional tip. Endo Success Retreatment kit (Satelec Acteon, Mérignac, France) on a piezoelectric ultrasonic equipment Acteon Satelec (Acteon Satelec, Mérignac France) is designed to assist removal of fragments path. (3)

The purpose of this case report is to present a clinical case of the retrieval of Hedstrom file in buccal canal of maxillary first premolar using endodontic ultrasonic device (Satelec Acteon, Mérignac, France) assisted with the dental operating microscope.

CASE REPORT

A 49-year-old female patient was referred to the Department of Endodontics in order to have endodontic retreatment in her right first maxillary premolar tooth. Her clinical examination did not reveal any pain to percussion, normal gingiva, temporary restoration on the cavity. The preoperative radiograph showed radiopaque material within one third coronal of gutta percha in buccal canal as broken file, radiolucent at both mesial and distal apices (Fig 1). The diagnosis for tooth 14 is chronic periapical abscess.

Fig 1. Preoperative Radiograph Tooth 14

The dental operating microscope was arranged for the procedure. Access cavity preparation was performed using Endo-z burs (Dentsply, Maillefer, Baillauges, Switzerland). Creation of a straight line access was an essential first step to allow maximum visibility of the broken files. The Endo Success Retreatment kit (Acteon, Mérignac Cedex, France) ET20 tip was used to prepare a platform at the coronal end of the fragment. The two phase removal technique (using hand instruments to bypass the fragment and applying ultrasonic device to loosen it) was used. (6)

After bypassing the fractured instrument, coronal flaring of the root canal orifices was carried out with K-file No. 15 2% taper (Dentsply, Maillefer, Baillauges, Switzerland) in order to enhance access and
visualization. Observation of the fragment with the aid of an operating microscope under 12,8x magnification until the top side of the fractured instrument visible as a shining spot. Some attempt at retrieval had been made but the fragment was pushed to middle canal (Fig 2). It was decided to call the patient for a second appointment. Calcium hydroxide was placed in the canal and a ball of cotton was placed with temporary restoration (Cavitron, GC Corporation, Japan) inside the pulp chamber.

Fig 2. The broken file pushed out to middle canal when an attempt to retrieve the broken file was taken

Second Visit - The calcium hydroxide was flushed out with NaOCl 2,5%. After drying the canal, the file was visualized with dental operating microscope FM and a long tipped ET25L Endo Success Retreatment kit (Acteon, Merignac Cedex, France) was used to ditch around the fractured fragment. The instrument was moved in a anticlockwise direction around the broken file. The ultrasonic vibration was sent along the length of the file by wedging the ultrasonic tip between the dentin wall, gutta percha and the file. This completely loosened the file fragment and it “jumped out” from the canal after that (Fig 3). Ultrasonic device is used without water spray to get better visualization, but activation is only done every 15 seconds, and then given a break to avoid the conduction of generated heat that will compromise the periodontal tissue condition.(7)

Fig 3A. Broken file has already taken out

Fig 3B. broken file measuring about 10 mm

An electronic apex locator (Raypex 6, VDW, Munich, Germany) was used to verify the working length in all root canals after broken file and gutta percha have been removed. All the canals (buccal and palatal) were instrumented with 2% files to patency and after achieving a glide path, preparation of the root canal with crown down manner using Universal ProTaper hand use (Dentsply Maillefer, Switzerland) starting from #S1 to #F3 with RC-Prep (Premier® Dental Products Company) as
a lubricant. Flush the canal under copious irrigation with 2.5% sodium hypochlorite, normal saline and irrigation with EDTA 17% for 2 minutes. The canals were filled by the single cone technique using gutta percha (Dentsply Maillefer, Switzerland) and AHPlus as a root canal sealer (Dentsply Maillefer, Switzerland). A temporary filling (Caviton, GC Corporation, Japan) was placed and a postoperative radiograph was taken to assess the quality of obturation (Fig 4).

DISCUSSION

Success in broken file retrieval was determined by several factors such as root canal curvature, broken file location of the curvature, type of tooth and root canal, a broken fragment length, and the type of instrument. Based on the type of teeth and root canals, fracture mostly occurred at the buccal upper molar root canal and mesial lower molar root canal. The highest success rate based on location is 1/3 of coronal compared to 1/3 middle or apex. Fragments located in far below the curvature or within the curvature has a low success rate compared to fragments at coronal curvature in straight root canal. Root curvature of 0-20° has the highest success rate while 21°-50° curvature has the lowest. Instrument length of more than 5 mm has the
highest success rate. Fragment retrieval of instruments made from stainless steel has a success rate of 97% which is higher than NiTi instruments, 95%. (8)(9)

In this case, stainless steel file Hedstrom # 30 was broken in the 1/3 coronal, this is in accordance with above theory stated that the stainless steel material is easier to retrieve than NiTi file. The decision to retrieve the broken file was because it was in maxillary premolar tooth. Maxillary premolar tooth has the highest rate of success of file retrieval. The straight canal anatomy and the fragment location made it easier for the broken file to be retrieved. (8)

Hedstrom instrument effectively cut dentin in a clockwise direction caused interlocking file inside the root dentin so that the success rate would be lower compared to another instrument types. (3)(9)

The broken hedstrom file occurred in this case was happened at previous retreatment by another operator so that one side of the file was locked to gutta percha and the other side locked to dentin. The next process was gutta percha retrieval with hedstrom file # 15 and # 20 which was aimed to loosen the bond between fragment and gutta percha. But while gutta percha was retrieved, fragments was pushed into the middle third of the root canal and leaving gutta percha in the apical third. Gutta percha that left in the root canal would compromise the cleaning and shaping process. Thus the broken fragment should be removed from the root canal. According to previous case reports, the main factors that worsen the prognosis of the broken file cases was periapical lesions. In this case there was a chronic periapical abscess so that bypass procedure or leaving fragments in the root canal as obturation material was not an ideal treatment. (10)

In this case, microsonic method used in the buccal root canals of maxillary first premolar using piezoelectric ultrasonic endodontic FS Satelec (Acteon, Bordeaux Cedex, France). This endodontic ultrasonic function was to ditch the dentin tissue so that good visualization was obtained and staging platform was formed by using the 20 mm length Endo Success Retreatment kit (Satelec Acteon, Mérignac, France) ET20 tip around the fragment that can deliver vibration to broken fragments so that the fragments can be loosened from the dentin. (11)(7)

After visualization obtained, bypass experiments was done with watch winding movement, after the fragments can be passed by k-file # 10 and then increased to the k-file # 15 aims to release the bond between fragments and dentin. After that, the fragments were pushed to middle canal so that longer tip ET25L eido Success Retreatment kit (Satelec Acteon, Mérignac, France) 25 mm length is used. Ultrasound is used without waterspray to get better visualization, but activation is only done every 15 seconds, and then cooling down phase is given to avoid generated heat that can compromise the periodontal tissue. Next capacity from the broken stainless
steel Hedström file inside the root canal is continuous. It is higher compared to NiTi files, so that ultrasonic vibrations can loosen the file without destroying the file itself. This is consistent with case reports by Agrawal V. (3)(7)

Hedström file has positive rake angle section that effectively cutting dentin in clockwise direction. So during the vibration, ultrasonic is directed in counterclockwise direction to release fragments inside the root canal. (1)(2)

In the past, broken instrument was retrieved using files with smaller size or if the broken instrument cannot be taken out, bypass technique will be performed. Over the time, many techniques to retrieve broken file have developed such as canal finder system, Masseran kit, endo extractor system, ultrasonic, and some type of pliers but are often less effective due to limited visualization. Endoextractor technique using cyanoacrylate is frequently used but clinical implication can cause contamination to dentin tubules because the acrylic material will block it out. (11) Stainless steel instruments is generally broken because of the torsional fracture or flexural fatigue. Torsional fracture occurs when the tip of the instrument is locked in the root canal, while the tip of the instrument is still rotating. Fracture occurs when the alloy elasticity limit is exceeded. It may be caused by excessive load given to the instrument apically during instrumentation or large root canal curvature angle. Flexural fatigue occurs when the instrument continuously rotates freely in the root canal curvature resulting in compression/strain cycle exceeding the maximum flexibility of the instrument causing fractures. These fractures may occur due to the overuse of alloy metal, corrosion, and changes due to thermal expansion and contraction. (13) In this case, broken Hedström file may be caused by the diameter of the root canal formed between gutta percha and root canal wall is too small, so that during the penetration, torsional fracture occurs due to the restraint of the tip when the tip of the Hedström file is rotated. Besides that, the excessive pressure applied apically on the file can cause broken instrument. (14)

CONCLUSION

The success retrieval of broken file in this case is supported by the location of the file that is located in the middle third of the root canal, anatomy of the root canal is straight, and the use of ultrasonic assisted with dental operating microscope.

REFERENCES

3. Agrawal V, Kapoor S, Patal M. Ultrasound Technique to Retrieve a Rotary Nickle-Titanium File Broken Beyond the Apex and a Stainless Steel File from the Root Canal of a Mandibu


