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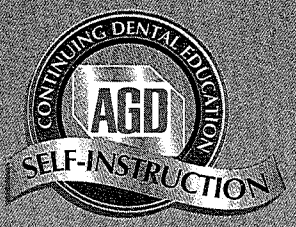

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Abstract
Localized juvenile periodontitis (LJP) causes severe alveolar bone loss and early tooth loss in adolescents and young adults. If it is not appropriately treated as an infection in association with *Actinobacillus actinomycetemcomitans*, treatment failure is likely. This review of clinical trials of treatment of LJP uses those trials to construct guidelines for LJP treatment.

A review of localized juvenile periodontitis (LJP): II. Clinical trials and treatment guidelines

Note: This is Part II of a two-part article. Part I appears on pages 491–497 of the September/October 1998 issue of *General Dentistry*.

Localized juvenile periodontitis (LJP) is an uncommon, yet severely destructive disease that occurs in adolescents and young adults. As discussed in Part I of this article, the primary etiology of LJP is infection with *Actinobacillus actinomycetemcomitans* (*A.a.*).[1] Clinical trials of treatment have focused attention on the elimination of *A.a.* as a means of arresting disease progression and maintaining the dentition. Here, diagnosis and treatment guidelines are proposed for LJP, based on a review of the scientific literature.

Diagnosis

LJP usually presents itself as severe vertical bone loss, detected on molar bitewing radiographs. For early detection of LJP, careful interpretation of radiographs is essential. Such detection also should include other factors, such as attachment loss and family history. Mann et al. evaluated radiographs for cementoenamel junction (CEJ)-alveolar crest distance greater than 1.0 mm, widening of the periodontal ligament space, absence of crestal cortical plate, and loss of trabeculae, but found no relationship with probing attachment loss in a group of 12- to 16-year-olds.[2] The normal level of the alveolar crest is about 1.0 mm apical to the CEJ. An alveolar crest more than 2.0 mm from the CEJ may represent bone loss.[3] Crestal lamina dura is not a reliable indicator of early periodontal disease activity and should not be used as a sole indicator for LJP.[4,5] Therefore, it is the height of the bone, and vertical defects in particular, that indicate the presence of LJP.

In addition to radiographs, careful probing is essential in the diagnosis of LJP. The clinician must take into consideration the degree to which the gingival tissues are inflamed, which may mean that a 5.0 mm probing depth is a pseudopocket. The probe may be stopped from reaching the base of the pocket by heavy calculus. Therefore, loss of attachment is evidence that periodontitis is present. This is detected when the probe penetrates past the CEJ of the tooth, and the root surface can be felt. Now the inflammatory process has moved beyond gingivitis, and is periodontitis. Attachment loss during adolescence often is indicative of early-onset periodontitis (EOP). Therefore, when a tentative diagnosis of LJP has been made, the clinician should include attachment level charting in his or her clinical database, in addition to probing depths.

In diagnosis of bone or attachment loss in children and adolescents, a careful distinction should be made between what is truly EOP, and what is an incidental loss of attachment (IAL). IAL is loss of attachment or bone that is directly associated with a local plaque-retentive factor, such as an overhanging restoration, deep caries, severe crowding, or a pulpal/periapical pathological entity. Both EOP and IAL may cause early bone loss, but the etiology (and therefore, treatment) of these two problems is distinctly different.

As with other forms of periodontitis, the baseline database includes an assessment of oral hygiene, and recording of sites that bleed in response to probing. These factors are necessary to assess the response of the patient to oral hygiene instructions, and to assess reduction of inflammation in the gingival tissues. Without such a comprehensive database, it is difficult to know how to treat different sites appropriately, to determine the magnitude of clinical improvement after therapy, and to assess long-term stability in the maintenance phase.

An additional means that may be used in the diagnosis of LJP is microbial testing. Microbial testing can be useful for determining whether the pathogen *A.a.* is present, and whether it has been eliminated after therapy. Microbial culture and antibiotic sensitivity testing can assist in appropriate antibiotic selection. However, culture and sensitivity studies can be prohibitively expensive for many patients, so antibiotics often may be used empirically, based on the association of *A.a.* with LJP. A less expensive alternative to culture and sensitivity studies is the DNA probe, which can determine the presence of *A.a.*, but not the antibiotic sensitivity for the individual patient's specific strain. Further, microbial testing can be used in the maintenance phase, to monitor for reinfection with *A.a.*

Finally, in diagnosing LJP in its early stages, it may be helpful to obtain a family history of periodontal disease and tooth loss experience. LJP has a genetic basis for susceptibility, and tends to occur in families.[6] The patient's history may reveal that his or her parents or older siblings have lost several teeth at an early age as a result of LJP. If this is the case, incipient bone loss or periodontal pockets in an adolescent patient are more likely to be interpreted as the onset of LJP. A guide for diagnostic data collection for LJP is summarized in Table 1.

Table 1. LJP diagnostic data collection.

A. Full-mouth probing chart with attachment levels and bleeding on probing
B. Oral hygiene assessment
C. Radiographs: panoramic, bitewings, PA of each affected tooth
D. Sibling screening/family history
E. Microbial testing (this is an optional adjunctive step)

Treatment

Treatment strategies have been developed for LJP; the elimination of *A.a.* is the goal of treatment. This should stop the progression of the disease, and produce an environment in which healing can occur. Continued suppression of *A.a.* is the goal for post-treatment stability. A secondary treatment goal may be restoration of the lost attachment apparatus.

The first clinical trials of the treatment of LJP as an *A.a.* infection were published in 1983–85. Slots and Rosling treated six LJP patients over the course of 22 weeks, with the following sequence: (1) 6 hours or more of scaling and root planing during the first 12 weeks; (2) 10 minutes of subgingival iodine application at week 16; and (3) 2 weeks of systemic tetracycline (250 mg, 4 times per day) administered from weeks 20 to 22.[7] Although scaling and root planing decreased inflammation and pocket depths somewhat, the attachment levels continued to deteriorate. Most importantly, mean *A.a.* concentrations remained high, and all pockets tested were still infected. The *A.a.* levels remained unchanged after iodine irrigation. Two weeks after tetracycline therapy, only 4 of 20 pockets (all in one patient) still had *A.a.* at detectable levels, and the mean levels were decreased by more than 90 percent in the pockets that still harbored *A.a.* After tetracycline therapy, attachment level gains were seen, but the pockets that still were infected continued to lose attachment. This demonstrated that scaling and root planing alone and with iodine irrigation were ineffective in controlling *A.a.*, the etiologic organism in LJP, and could not arrest its progression. It also demonstrated that systemic tetracycline was very efficacious for reducing or eliminating *A.a.* from periodontal pockets, and was effective clinically. However, at 9 to 15 months, half of the patients were *A.a.*-positive again, and the levels of this organism appeared to be increasing.

Lindhe and Liljenberg reported the results of treatment of LJP with a five-year follow-up period.[8] Sixteen patients were treated with modified Widman flap surgery (including removal of granulation tissue and root planing, but no osseous surgery), and a 2-week regimen of tetracycline, 250 mg, 4 times per day. For the first 6 months, the patients returned each month for polishing. For the remainder of the five-year period, they returned every 3 months for maintenance. Plaque scores were 67 percent at baseline and decreased to 19 percent at 6 months and 14 percent at 5 years. Mean probing depths of diseased molars decreased from 8.6 mm to 3.4 mm at 6 months, and remained stable for 5 years. For

Table 2. LJP treatment sequence.

A. Oral hygiene instructions/patient education
B. Gross calculus debridement (if needed)
C. Surgical treatment of pockets >5.0 mm, root planing and curettage of shallower lesions. Use chlorhexidine 1 to 2 weeks after surgery, then add interproximal brushing.
D. Antibiotic therapy concurrent with surgery and/or root planing (empirical regimen or based on microbial testing)
E. Evaluation of results (4 to 6 weeks after therapy)
[Repeat microbial testing—*A.a.* should be eliminated]*
Success = good oral hygiene, reduced probing depths, no bleeding on probing, gain of clinical attachment [elimination of *A.a.*]*
F. Retreatment of deep, bleeding pockets (if needed)
G. Maintenance every 3 months
1. Probe
2. Radiographs, as needed
3. Reinforcement of oral hygiene instructions
4. Prophylaxis/root planing
[5. Microbial testing]*

*Brackets indicate optional adjunctive step

diseased incisors, probing depths decreased from more than 7.0 mm to less than 4.0 mm. Molars gained 5.0 mm, and incisors gained 2.0 mm of clinical attachment at 6 months; this attachment was sustained for five years. However, 25 percent of the patients had recurrent lesions within the first 12 months after treatment, indicating a high potential for recurrence. These patients were treated again in the same manner as before, and there was no further recurrence for five years. Additionally, partial to nearly complete resolution of the bony defects was observed (though not quantified). This study demonstrated that a combined surgical/tetracycline treatment protocol, in a patient sample that complied with a three-month maintenance interval, was highly effective in the treatment of LJP. However, in the first 12 months, recurrence could be a problem.

Christersson et al. demonstrated the importance of surgical treatment of LJP patients to remove tissues that were infected with *A.a.*[9] Comparing root planing to modified Widman flap surgery, *A.a.* was not reduced in the lesions that were root planed only, but in 80 percent of the surgical sites, *A.a.* was undetectable 1 week later. Sixteen weeks later, 50 percent of the sites still did not have detectable levels of *A.a.* Probing depths improved in the surgery group, but not in the root planing group. In this study, tetracycline was not used, and the results were not as favorable as in the Slots and Rosling study.[7] It was suggested that suppression of *A.a.* would be more predictable if surgery and antibiotics were used together.

The need for surgical treatment and antibiotics was questioned by Wennstrom et al.[10] Sixteen LJP patients had modified Widman flap surgery on one side of the oral cavity, and scaling and root planing on the other side. No antibiotics were prescribed. The teeth were polished (for plaque removal) every month for six months, and then maintenance was performed every three months for two years. From two to five years, the patients were released from the maintenance schedule to see their usual dentist "as needed." At six months, probing depths in the surgical sites decreased from baseline 7.4 mm to 3.7 mm. Probing depths at nonsurgical sites decreased from 7.0 mm to 3.8 mm. These improvements remained stable for two years, but deteriorated by five years, after maintenance was discontinued. In both groups, attachment gain of approximately 2.0 mm was observed at six months and at the two-year evaluation, but at five years, the attachment gain decreased to about 1.0 mm. Mean bone fill of 2.0 mm was observed at two years. Numerous sites experienced recurrent attachment loss during the three-year period without maintenance. Eighty-four percent of the sites that lost attachment were in the nonsurgical group. Unfortunately, the only time at which *A.a.* was monitored was at five years, so the short-term post-treatment effect on *A.a.* is unknown. This study challenges the conventional wisdom (and many other studies) that suggests that surgery and/or antibiotics are necessary for the treatment of LJP. Optimal, frequent, professional plaque control was noted to determine the success of the treatment. The clearest finding of this study is that a three-month recall interval for maintenance is needed to sustain the probing depth reduction and attachment gain from LJP treatment over the long term. However, surgically treated sites were less likely to lose attachment during the period with inadequate maintenance visits.

Palmer et al. used tetracycline in a double-blind, controlled clinical trial for treatment of juvenile periodontitis.[11] In the initial phase of the study, 19 controls received root planing and oral hygiene instructions. In addition to root planing, the 19 test subjects also received tetracycline 250 mg, 4 times per day for 14 days. Three months after treatment, the patients who received tetracycline had superior probing depth reduction, less bleeding on probing, and better clinical attachment gain, compared to the controls. Additionally, only 58 percent of the initially affected teeth in the tetracycline group required

Fig. 1a. Vertical bony defect on the distal surface of tooth No. 3 in an LJP patient.

Table 3. Antibiotic regimens for LJP.

Medication	Dosage
Tetracycline, 250 mg; Disp: 56	Take 1 capsule 4 times per day for 14 days
Doxycycline, 100 mg; Disp: 15	Take 1 capsule every 12 hours the first day, then take 1 capsule per day for 13 more days
Amoxicillin/metronidazole combination:	
Metronidazole, 250 mg; Disp: 21	Take 1 tablet 3 times per day for 7 days
Amoxicillin, 250 or 500 mg; Disp: 21	Take 1 capsule 3 times per day for 7 days

surgery, but 75 percent in the control group were still >5.0 mm and bled upon probing. In the second phase, all sites >5.0 mm that bled upon probing received modified Widman flap surgery, and half of the subjects received tetracycline. From three to nine months after surgery, probing depths were reduced to a mean of 2.0 to 3.0 mm in both groups, and the number of sites with >5.0 mm also decreased; there was no statistically significant difference between the groups. Bleeding on probing was less in the tetracycline group three months after surgery (20 percent compared to 32 percent). Therefore, tetracycline was shown to be beneficial in a nonsurgical phase of treatment, which reduced the need for surgery at several sites. However, 90 percent of the subjects in the tetracycline group still required surgical treatment. Additionally, this study did not monitor *A.a.* levels, so comparisons of the different treatments for suppression of *A.a.* cannot be made.

Novak et al. investigated long-term use of tetracycline in four subjects.[12] In this noncontrolled study, subjects 13 to 15 years old, who had early onset of LJP lesions, were given tetracycline (250 mg, 4 times per day for 6 weeks). The lesions were neither root planed nor surgically treated, because of the assumption that calculus was not yet present. Three patients were monitored after one year, and one patient was re-examined after four years. One to four years after treatment, probing depths were reduced from an initial mean of 7.1 mm to 3.6 mm. The mean attachment level gain was 2.9 mm, and bone defects had 72 percent fill radiographically. However, whether any individual sites had persistent or recurrent disease was not addressed. *A.a.* levels before and after treatment were not determined. That a single individual sustained clinical improvement four years after tetracycline therapy alone does not provide enough evidence that this is a predictable treatment. At best, this study suggests that tetracycline is beneficial for treatment of LJP.

Use of tetracycline fibers and systemic doxycycline was investigated in a small study reported by Mandell et al.[13] Tetracycline fibers were placed in 11 *A.a.*-infected pockets of LJP patients, but four weeks later, the *A.a.* levels were unchanged. Then, the subjects received systemic doxycycline for 14 days (100 mg every 12 hours the first day, then 100 mg per day for 13 days), and surgery also was performed in some of the sites. Eight weeks after antibiotic therapy, *A.a.* was not reduced in 5 of 5 pockets that were not instrumented, while it was eliminated in 8 of 9 sites of the patients in whom surgical treatment was done and antibiotics were administered.

Mandell and Socransky further evaluated the effects of surgery when combined with the administration of systemic doxycycline.[14] Three months after treatment, *A.a.* was eliminated in 17 of 22 sites. The sites in which *A.a.* was not eliminated continued to deteriorate, but overall, dramatic clinical improvements were seen. For example, mean probing depth was initially 7.6 mm and improved to 3.8 mm, 1.2 mm of attachment was gained, and bleeding on probing decreased from 95 percent to 27 percent. Disease recurred in 2 of 8 patients in 12 months—the same 25 percent rate reported by Lindhe and Liljenberg.[8] These two studies again indicated the utility of a combined surgical/antibiotic treatment regimen for LJP, and confirmed the potential for recurrence. It was also indicated that tetracycline fibers are not effective for treatment of LJP.

Two studies by van Winkelhoff et al., in 1989 and 1992, report on the combined use of metronidazole and amoxicillin to eliminate A.a. in EOP.[15,16] In the first study, 11 patients with LJP in which *A.a.* was detectable, were treated with root planing and antibiotics. Metronidazole (250 mg) and amoxicillin (375 mg) each were taken 3 times per day for 7 days. Two to four months after therapy, only one patient had detectable levels of *A.a.*, and this effect persisted up to the 9- to 11-month follow-up visit. Probing depths were reduced from 7.4 mm to 5.5 mm. This small, short study produced encouraging results for the use of this combination antibiotic therapy.

The second study included 28 *A.a.*-infected LJP patients, who

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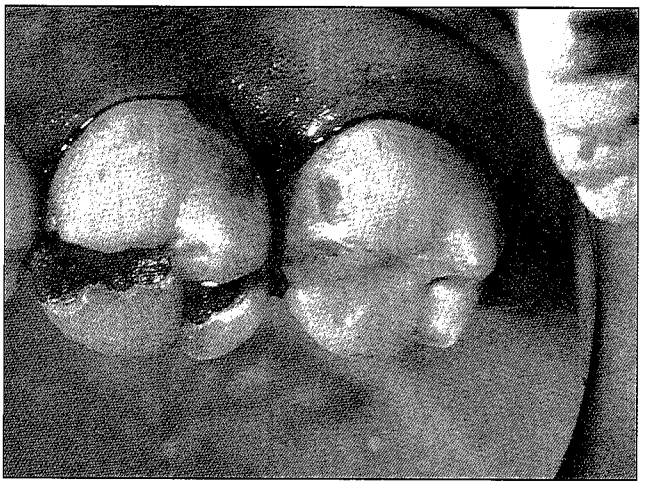


Fig. 1b. Sulcular incisions have been made for access to vertical bony defect on the distal surface of tooth No. 3 (buccal view).

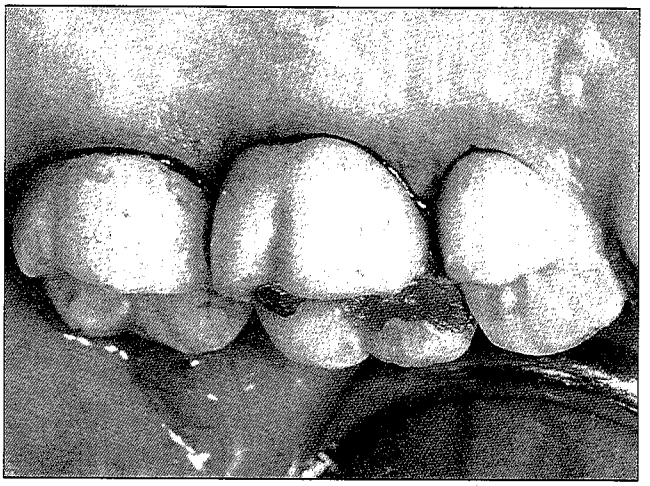


Fig. 1c. Palatal view of the procedure shown in Fig. 1b.

also were treated by root planing and the same antibiotic regimen (metronidazole [250 mg] and amoxicillin [375 mg] 3 times per day for 7 days). The four deepest sites were sampled three to nine months after treatment, and *A.a.* remained detectable in those sites in only two of the 28 patients; these levels were 80 times lower than levels prior to treatment. Probing depths were reduced from a mean of 8.0 mm to 5.8 mm, 1.3 mm of attachment was gained, and the bleeding index decreased by 75 percent. This study demonstrated that a combination of metronidazole and amoxicillin, along with root planing, was effective in eliminating *A.a.* from lesions associated with LJP, and in improving the clinical parameters of disease.

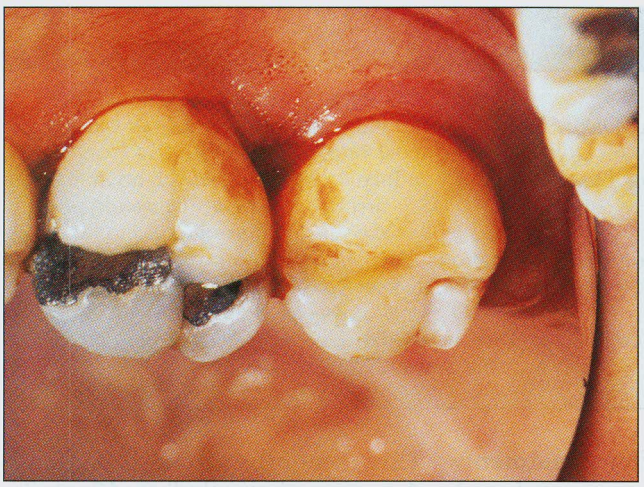
Metronidazole alone has been compared to tetracycline for suppression of *A.a.* and improvement of patients with LJP.[17] Twenty-seven LJP patients were allotted to three groups, each of which received one of the following medication regimens: (1) metronidazole (200 mg), 3 times per day for 10 days; (2) tetracycline (250 mg), 4 times per day for 12 days; and (3) no medication. Scaling and root planing were done for patients in all three groups, and surgery was performed at sites that had probing depths of 6.0 mm or more at the 6-month follow-up appointment. The four deepest sites (or 36 per group) were sampled for the presence of *A.a.* at baseline, six months, and 18 months. At six months, *A.a.* remained in only 2 sites (baseline = 30) in one patient from the metronidazole group. Half of the tetracycline group sites (14 of 26) were still infected. At 18 months, no metronidazole sites had *A.a.*, while 9 of the tetracycline sites did. While these numbers favor metronidazole, no statistical analysis was provided to show that this difference was statistically significant. Additionally, earlier studies recommended that tetracycline be used for 14–21 days, rather than the 12-day period used in this study.[7,8] But these last three studies suggest that metronidazole is a better antibiotic choice for LJP than tetracycline.

Two other 1990 studies reported by Saxen and associates suggested that doxycycline did not provide any additional benefit when used in conjunction with scaling and root planing.[18,19] However, the patient samples were not matched well for probing depths and tooth types that were treated. Also, the sample sizes were small, making statistical significance of any difference difficult to achieve.

Subgingival placement of 1 percent chlorhexidine gel or 40 percent tetracycline paste after root planing was compared to root planing alone by Unsal et al.[20] The only significant difference between treatments was found in interproximal sites, where root planing alone resulted in superior probing depth reduction compared to the groups in which adjunctive antimicrobials were used. One may conclude from this study and that of Mandell et al.[13] that local antimicrobial therapy is ineffective for treatment of LJP.

The vertical bone loss that is typical of LJP lesions would appear to need treatment with some kind of regenerative procedure, such as grafting with freeze-dried bone allograft, or using a membrane for guided-tissue regeneration (GTR). However, these modes of surgery are not necessary to preserve the dentition of most LJP patients. To illustrate this point, summarized below are two studies that investigated the use of bone grafts and regeneration for LJP.

In 1984, Mabry et al. reported that "local and systemic tetracycline coupled with freeze-dried bone allografts was the treatment of choice for defects associated with juvenile periodontitis."[21] The reason for this conclusion was that the defects treated with freeze-dried bone had twice as much



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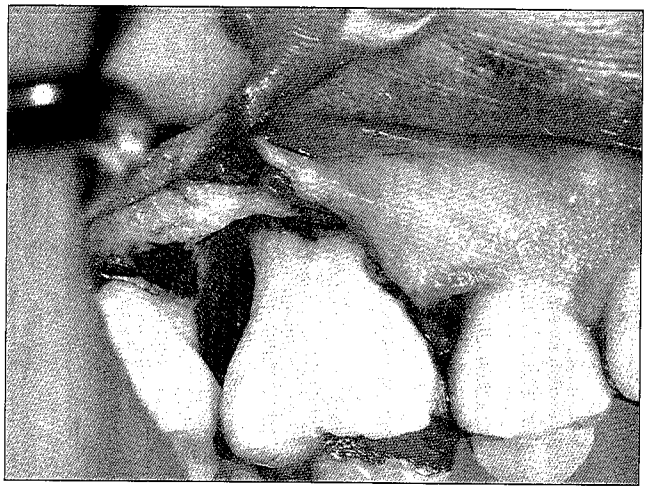

Fig. 1d. Full thickness flaps are reflected, granulation tissue is removed with curettes and ultrasonic instrumentation, and the root surface is thoroughly debrided with ultrasonic instrumentation and curettes.

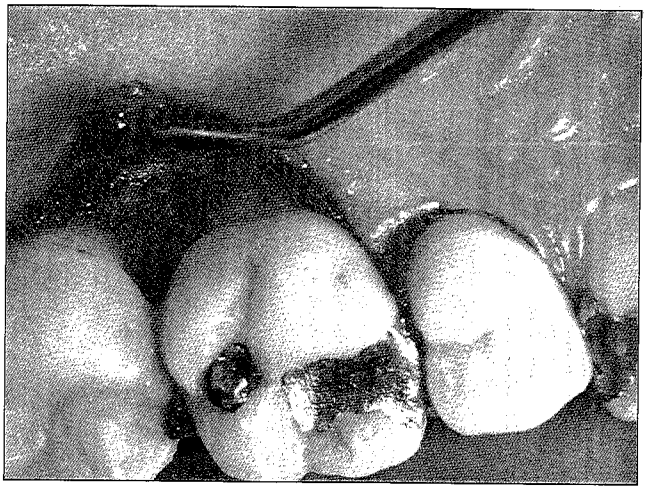

Fig. 1e. Palatal view of flap reflection and debridement.

bone fill at 12 months (2.8 versus 1.4 mm) than those treated with open flap debridement (patients in both groups also received systemic tetracycline). However, the data also demonstrated that the pocket depth reduction and the clinical attachment gain were the same for both treatments, which should translate into equal effectiveness in maintaining the teeth. It should be noted that open flap debridement is less technically demanding and less expensive than bone grafting.

A more recent study compared open flap debridement, GTR alone, and GTR with demineralized freeze-dried bone for the treatment of LJP defects.[22] Patients in all groups also received systemic doxycycline. Twelve months after treatment, bone fill ranged from 52.7 to 65.2 percent, with no statistically significant difference between treatment groups. Attachment gain was the same for all groups (3.0 to 3.2 mm). Therefore, it was concluded that open flap debridement is as effective as regenerative surgery for treating LJP.

A study comparing GTR to osseous surgery found greater probing depth reduction and attachment level gain for GTR. However, due to its design, this study does not demonstrate either GTR or osseous surgery to be superior to open flap debridement.[23]

Treatment methods

All of these clinical trials provide information that can be used to develop effective LJP treatment methods. Based on these studies, it is evident that:

(1) LJP is caused by *A.a.*

(2) *A.a.* is not eliminated predictably solely by performing root planing and oral hygiene.

(3) Subgingival irrigation, gels, and tetracycline fibers are ineffective treatments for *A.a.*

(4) Use of systemic antibiotics reduces or eliminates subgingival *A.a.*

(5) Use of metronidazole and amoxicillin combined appears to suppress *A.a.* best.

(6) *A.a.* invades the granulation tissue around periodontal pockets.

(7) Surgery removes granulation tissue that harbors *A.a.*

(8) Elimination of *A.a.* results in clinical improvement.

(9) An initial nonsurgical phase of therapy may reduce the number of sites that need surgery in the treatment of LJP.

(10) LJP has a high frequency of recurrence in the first year after therapy.

(11) Periodontal therapy in the absence of maintenance is ineffective, but a 3-month recall interval is consistent with maintenance of periodontal health.

(12) Regenerative types of surgery have not demonstrated an advantage over open flap debridement for maintaining attachment.

These factors indicate that a reasonable approach to predictable LJP treatment would include antibiotics, surgery, a consistent oral hygiene regimen, and maintenance therapy (Table 2).

The patient needs to be aware of the status of his or her infection, and how oral hygiene plays a role in the healing process and maintenance of treatment. Scaling and root planing prior to surgery are indicated when gross accumulation of calculus would take excessive time to remove during surgical treatment. Patients with only shallow pockets (4.0 to 5.0 mm) should have initial therapy consisting of oral hygiene instructions, root planing, and antibiotics. For patients with scant calculus and deep pockets, proceed directly to surgery (with definitive root planing in shallower sites). A conservative surgical technique, such as open flap debridement or modified Widman flap, should be used (Fig. 1a–1g).

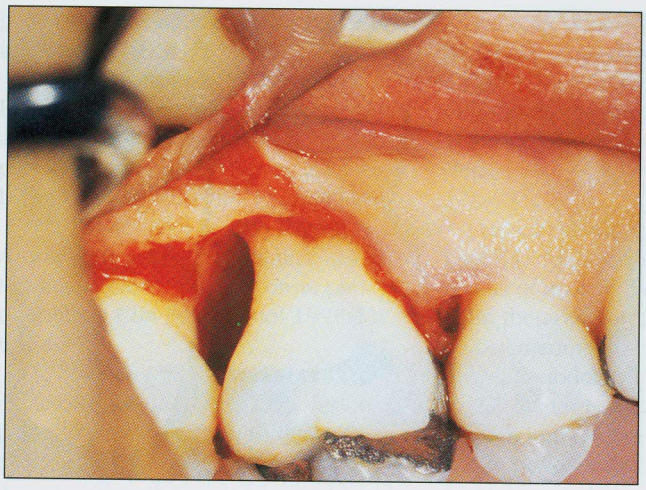

Fig. 1d. Full thickness flaps are reflected, granulation tissue is removed with curettes and ultrasonic instrumentation, and the root surface is thoroughly debrided with ultrasonic instrumentation and curettes.

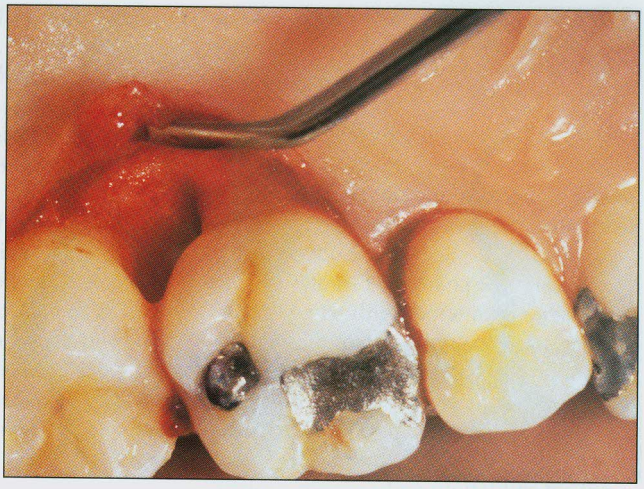

Fig. 1e. Palatal view of flap reflection and debridement.

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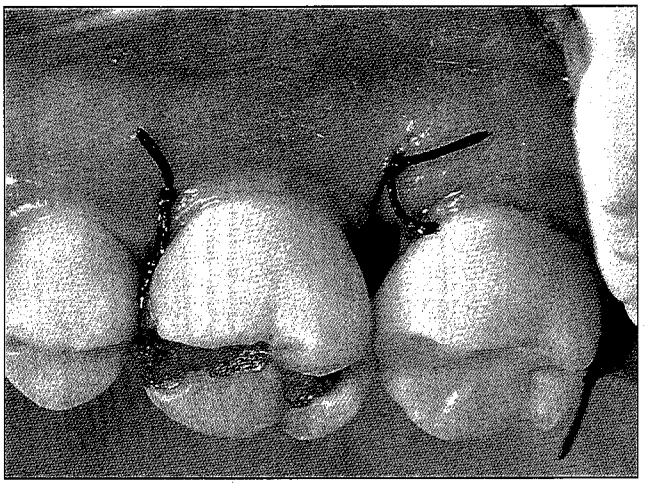

Fig. 1f. Flaps are replaced and stabilized with interrupted sutures.

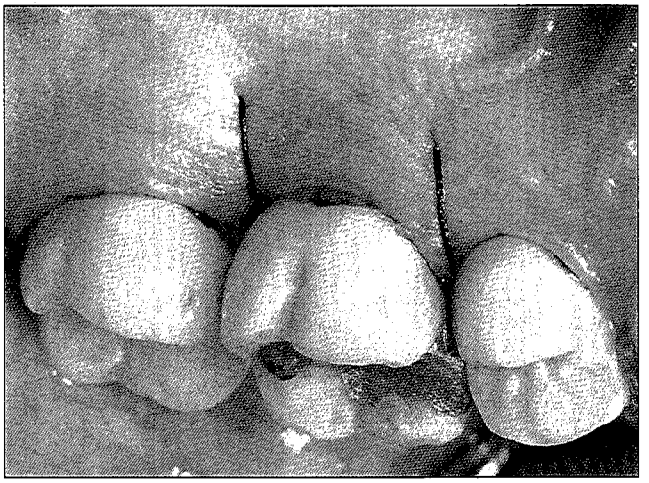

Fig. 1g. Palatal view of suturing.

The antibiotic therapy should be concurrent with the surgical therapy. Suggested antibiotic regimens for LJP are shown in Table 3. The response to treatment should be evaluated four to six weeks after surgery, to assess for probing depth reduction, bleeding on probing, oral hygiene, and ideally, microbial testing for elimination of *A.a.* Sites with continued bleeding on probing or suppuration, that are still 5.0 mm deep or more, or that still harbor *A.a.*, should be considered for retreatment. Clinicians should note that a 9.0 mm pocket will not often become a 3.0 mm pocket, but if it decreases to 5.0 to 6.0 mm, and bleeding on probing is eliminated, then improvement has been made. Continue to monitor that site at maintenance visits.

Since studies have shown a 25-percent recurrence rate in the first year after treatment, maintenance follow-up is essential. Check oral hygiene, look for increased probing depths, bleeding on probing, and loss of attachment. Radiographs one year after treatment may show significant bone fill in successfully treated and maintained areas. Scale, root plane deeper sites as needed, and polish for total plaque removal. Sites that experience recurrence should be retreated. Questionable sites should have microbial testing to check for reinfection with *A.a.* A new probing chart should be completed annually for three to five years. Thereafter, if clinical parameters remain stable, every three years is a reasonable interval for periodontal charting.

Conclusion

A number of clinical trials have shown effective ways of suppressing *A.a.* and controlling the progression of LJP. Diagnostic guidelines and a treatment sequence derived from these clinical trials are presented. The astute general practitioner, with high interest and skills in performing periodontic treatment, can manage most cases of LJP successfully according to these guidelines.

Author information

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7. Slots J, Rosling BG. Suppression of the periodontopathic microflora in localized juvenile periodontitis by systemic tetracycline. J Clin Periodontol 1983;10:465-476.

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Exercise No. 65

Registration and answers for Exercise No. 65 must be received by March 20, 1999.
Subject code: 490

The 15 questions for this exercise are based on the article, "A review of localized juvenile periodontitis (LJP): II. Clinical trials and treatment guidelines" by Carl J. Gustke, DDS, MS. The article appears on pages 580–587. This exercise was developed by R. Donald Hoffman, DMD, PhD, MAGD, a member of the *General Dentistry* Program in Self-Instruction Subcommittee. Answers for this exercise will be published in the March/April 1999 issue.

Answers for Exercises No. 61 and 62, which appeared in the July/August 1998 issue, appear on page 648.

Note to all participants:
Please keep a copy of your answers for your records.

Learning objectives

After you complete this exercise successfully, you will be able to:

- discuss treatment modalities for localized juvenile periodontitis (LJP);
- identify the etiology of LJP; and
- develop effective treatment modes for LJP.

Select the most correct answer to each question. You must answer at least 12 of the 15 questions correctly (80 percent) in order to receive credit.

1. As discussed in Gustke's article, the primary etiology of localized juvenile periodontitis (LJP) is infection with:
   A. *Staphylococcus auriens.*
   B. *Bacteroides gingivalis.*
   C. *Actinobacillus actinomycetemcomitans.*
   D. *Treponema pallidum.*

2. LJP usually is evidenced radiographically by severe:
   A. horizontal bone loss.
   B. vertical bone loss.
   C. medullary bone loss.
   D. cortical bone loss.

3. The author cites several criteria which should be met before a diagnosis of LJP is made:
   1. attachment level loss.
   2. positive family history.
   3. absence of crestal lamina dura.
   4. loss of bone height.
      A. 1 and 2
      B. 2 and 4 only
      C. 1, 2, and 4
      D. All of the above

4. Which of the following agents were noted by Slots and Rosling as efficacious and effective clinically for reducing and eliminating *Actinobacillus actinomycetemcomitans* from periodontal pockets?
   A. Systemic tetracycline
   B. Iodine irrigation
   C. 0.12 percent chlorhexidine gluconate
   D. Sodium oxalate

5. A study by Christersson et al. suggested that suppression of *Actinobacillus actinomycetemcomitans* was more predictable when _____ was/were employed.
   A. root planing
   B. modified Widman flap surgery
   C. surgery and antiobiotics
   D. root planing and antibiotics

6. It was determined that the preferred recall interval needed to sustain long-term probing depth reduction and attachment gain from LJP treatment is:
   A. 3 months.
   B. 4 months.
   C. 6 months.
   D. 9 months.

7. The effectiveness of tetracycline fibers in the treatment of LJP was:
   A. equal to systemic tetracycline.
   B. more effective than systemic tetracycline.
   C. less effective than systemic tetracyline.
   D. variable.

8. According to recent studies reported in this article, which surgical procedure in conjunction with systemic antibiotic therapy is the most effective in treating LJP?
   A. Open flap debridement.
   B. Guided-tissue regeneration (GTR) alone.
   C. GTR with demineralized freeze-dried bone.
   D. All are equally effective.

Self-Instruction Exercise No. 65, continued

9. *Actinobacillus actinomycetemcomitans* can be suppressed by a combination of:
   A. tetracycline fibers and subgingival irrigation.
   B. root planing and oral hygiene.
   C. metronidazole and amoxicillin.
   D. antibiotic gels and root planing.

10. LJP patients presenting with 4.0 to 5.0 mm pockets should have initial therapy consisting of:
   A. flap surgery with definitive root planing.
   B. antibiotic therapy.
   C. oral hygiene instructions, root planing, and antibiotics.
   D. regenerative osseous surgery.

11. A careful distinction must be made between EOP (early-onset periodontitis) and IAL (incidental attachment loss). Which of the following diagnostic criteria are consistent with IAL?
   1. Overhanging restorations
   2. Severe crowding
   3. Periapical pathology
   4. Deep caries
      A. 1 and 2
      B. 1, 3, and 4
      C. 1, 2, and 4
      D. all of the above

12. The initial treatment goal for a patient presenting with LJP is:
   A. elimination of *Actinobacillus actinomycetemcomitans.*
   B. restoration of crestal lamina dura.
   C. restoration of attachment height.
   D. minimize tooth loss.

13. The author cites studies which investigated the efficacy of several antibiotics in the treatment of LJP. He reported that the best choice is:
   A. penicillin.
   B. metronidazole.
   C. sulfamethoxazole with trimethoprim.
   D. tetracycline.

14. The vertical bone loss that is typical of LJP lesions would appear to need treatment with some kind of regenerative procedure, such as bone grafting. This mode of surgery is necessary to preserve the dentition of most LJP patients.
   A. The first part is true, but the second part is false.
   B. The first part is false, but the second part is true.
   C. The entire statement is true.
   D. The entire statement is false.

15. What is the recurrence rate of LJP one year after treatment?
   A. 15 percent
   B. 25 percent
   C. 35 percent
   D. 45 percent

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HOW IS CREDIT EARNED?
Participants must answer correctly a minimum of 12 of the 15 questions (80 percent) in order to earn two CE credits.

WHAT IF I FAIL?
A letter will be sent to all participants (AGD members as well as nonmembers) who score less than 80 percent.

DUE DATE
Answers are due no later than 3 months and 20 days after date of publication of the issue in which the exercise appears. For the November/December 1998 issue of *General Dentistry,* published on or around December 4, 1998, answers to Exercise No. 65 and 66 must be postmarked on or before March 20, 1999. ***CREDIT WILL NOT BE AWARDED FOR EXERCISES POSTMARKED AFTER THE DUE DATE.***

HOW IS CREDIT REGISTERED FOR MEMBERS?
The results of the exercises of Self-Instruction participants who are members of the Academy of General Dentistry are entered directly into their CDE (Continuing Dental Education) records maintained by the AGD's Dental Education Department. A printout of this report is mailed to members once a year in the spring. AGD members *will not* receive a letter acknowledging successful completion of each exercise. However, they may request a printout of their CDE record at any time during the year.

HOW IS CREDIT REGISTERED FOR NONMEMBERS?
Nonmembers will be notified by letter of the results of their successfully completed exercises. These letters may be submitted to the appropriate state board or agency for licensure purposes.

This exercise is due on or before March 20, 1999.