

PRIME CONTACTS— Predictable Reliable Interproximal Method to Obtain Proper Contacts

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In spite of a plethora of new and improved devices to help obtain interproximal contacts, inconsistent results cause many dentists to return to the placement of direct metallic restorations for predictable results. Conscientious dentists realize the importance of obtaining proper form and contour in the interproximal area.¹ Improper contacts can lead to plaque and food accumulation, which results in compromised gingival health, decay, advanced periodontal disease, and ultimately tooth loss. The dilemma is compounded because many patients are requesting esthetic alternatives. The dentist is perplexed, balancing what they know is esthetically acceptable to the patient with what they feel is in the best interests of the patient.

A single instrument usually cannot produce ideal results 100% of the time. However, through the synergistic use of several devices coupled with close attention to detail, universal success can be achieved. A step-by-step method will be demonstrated that can be learned and implemented successfully by most dentists.

Abstract

In spite of the introduction of many new and improved devices promising to readily obtain interproximal contacts in direct Class 2 composite restorations, inconsistent results frustrate many dentists. Improper contacts compromise the lifespan of the restoration and may cause impaired gingival health, decay, advanced periodontal disease, and tooth loss. One single instrument usually cannot produce ideal results all the time. However, through the synergistic use of several devices coupled with close attention to detail, universal success can be achieved. A systematic, step-by-step method is demonstrated using several innovative instruments to obtain predictably firm and proper interproximal contacts in Class 2 composite restorations. Attention to detail and the skill of the operator are paramount for success. With increased public demand for esthetic restorations, dentists must develop skills to place direct composite restorations predictably and confidently.

Learning Objectives

After reading this article, the reader should be able to:

- explain the importance of proper interproximal contacts in Class 2 composite restorations.
- identify critical aspects of preparation design which insure long-lasting successful Class 2 composite restorations.
- use several innovative instruments to predictably obtain firm and proper interproximal contacts in Class 2 composite restorations.

Case Study

A young man in his late 20s presented with interproximal decay clearly visible on routine radiographic films. The tooth had not

previously been restored and the image of the distal lesion appeared to be ideal in size. It had not progressed to a size that was visible clinically (Figure 1).



Figure 1—Preoperative view.



Figure 2—Tooth before final enamel margin preparation.



Figure 3—Final enamel margin preparation.



Figure 4—Custom shaping of contact forming instrument.



Figure 5—Final shape of contact forming instrument.



Figure 6—Separation of wedge.



Figure 7—Placement of matrix and wedge.



Figure 8—Ring placement.

Treatment Planning

The patient had received numerous successful direct composite restorations. He reported that he had not experienced postoperative sensitivity after placement of previous restorations and that the excellent longevity of his past restorations, which still appeared to be in excellent condition, gave him confidence in having composite used again. A direct placement distal-occlusal composite restoration was selected as the desired treatment by the patient and the dentist.

Preparation

The patient was adequately anesthetized and initial access to the carious lesion was done in a conservative manner without regard to outline form using a No. 330 carbide bur. The primary goal at this time was only to expose the decay. When located, the carious lesion was generally removed. Finally, a No. 1 round bur in a slow-speed handpiece was used to remove the final decay, ensuring the total removal of decay because only carious enamel and dentin are removed in composite preparations.²



Figure 9—Application of bonding agent.



Figure 10—Placement of flowable composite.

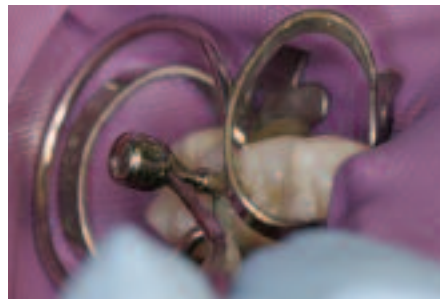


Figure 11—Composite instrument used to adapt composite into interproximal area.

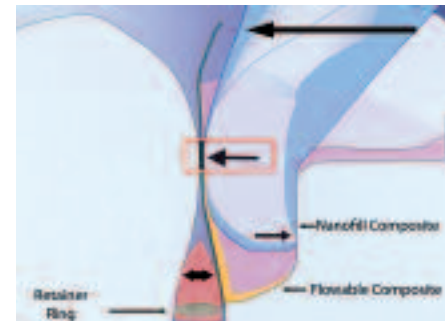


Figure 12—Cross sectional diagram of contact forming instrument with first increment.

It is imperative that the entire carious area is excavated when restoring with composite restorative materials. The final outline form was refined. The interproximal margins were flared outward to be at an angle greater than the plane of the enamel rods (Figure 2). The occlusal and interproximal margins were slightly beveled to expose the ends of the enamel rods³ (Figure 3).

Interproximal Try-In

A Trimax (AdDent, Inc) clear plastic light-transmitting contact forming instrument was tried in to the interproximal box. Several sizes of tip inserts were evaluated. The tips were too large. The current emphasis on preservation of tooth structure made it inappropriate to remove excess hard tissue just to accommodate the size of the tip. Because these tips are single use, they can easily be adjusted by using a sandpaper disc to allow proper fit (Figures 4 and 5).

A pink contoured wooden wedge (Clinician's Choice Dental Products, Inc) was selected because of its ideal small size. The wedge was tried in the interproximal area and removed. It was subsequently separated so that it fit completely into the interproximal and did not protrude beyond the lingual or buccal aspects of the tooth. This allowed room for the ring to contact the adjacent teeth and provide maximum separating pressure (Figure 6).

Restoration

Proper moisture control is essential when placing composite restorations.⁴ Ivory No. 2 and No. 3 rubber dam clamps (Heraeus Kulzer, Inc) were selected to clamp the hygienic Non-Latex Flexi-Dam (Coltène/Whaledent, Inc). The clamps were placed 1 tooth anterior and 1 tooth posterior to the

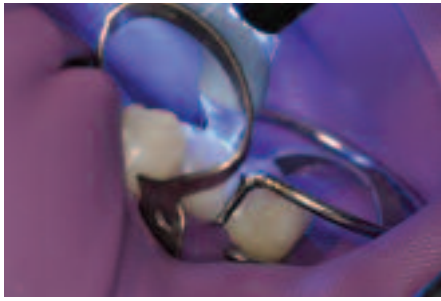


Figure 13—Curing through contact forming instrument.



Figure 14—Flowable composite placement before application of occlusal layer.



Figure 15—Shaping with finishing carbide.



Figure 16—Initial anatomy.



Figure 17—Polishing.

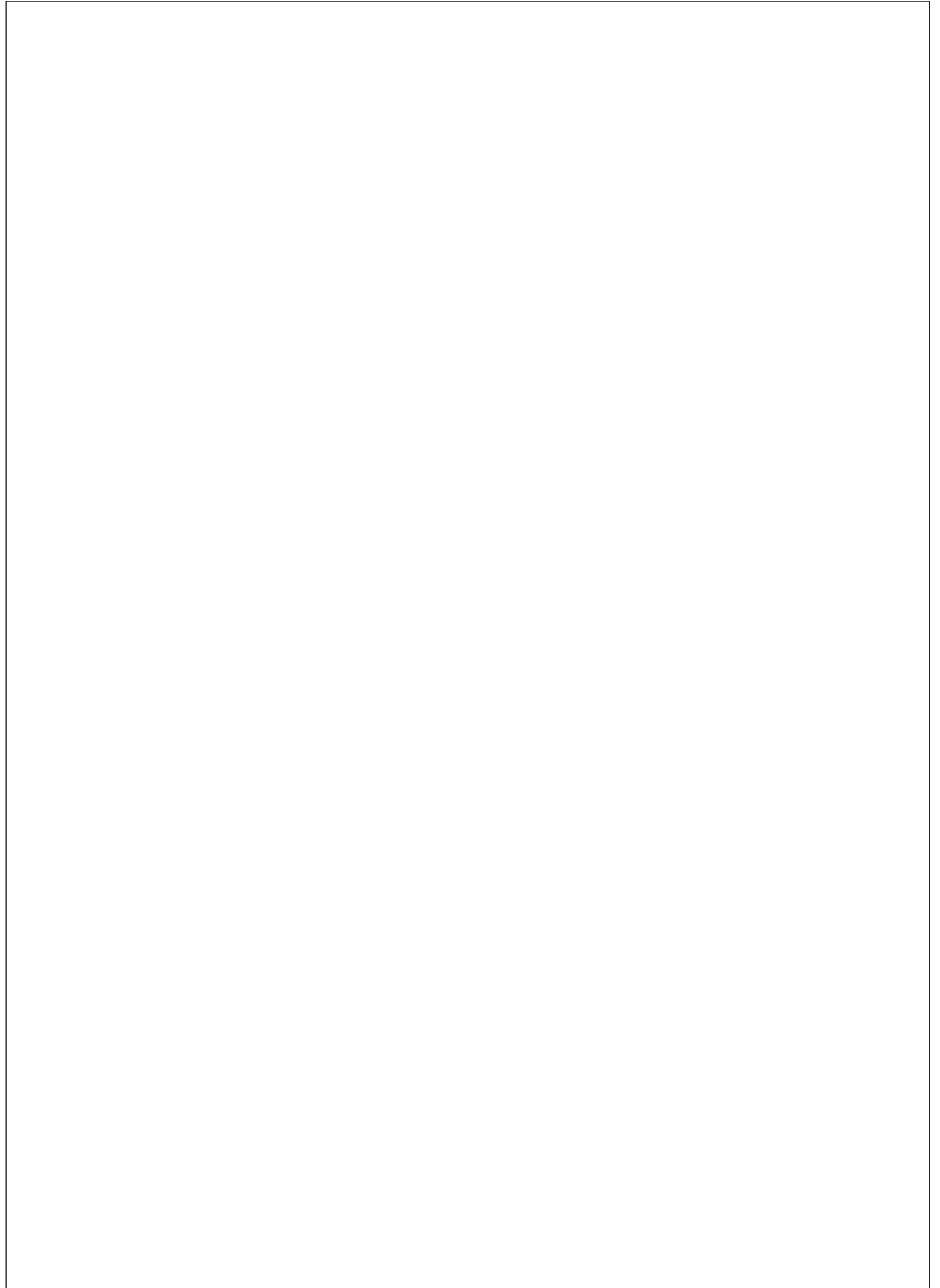


Figure 18—Postoperative view.

restored tooth. A metal sectional matrix was selected and inserted into the interproximal area. The preprepared wooden wedge was inserted (Figure 7) and a metal retraining ring (Composi-Tight, Garrison Dental Solutions) was placed (Figure 8). The light-transmitting instrument was retried to ensure proper access.

The tooth was washed and lightly dried. One Coat (Coltène/Whaledent, Inc) self-etching bond (Figure 9) was used according to the manufacturer's instructions. The bonding agent was light-cured.

Synergy Flow (Coltène/Whaledent, Inc) flowable composite was placed along the gingival margin and up the interproximal to obtain better adapted and sealed margins (Figure 10). Synergy NanoFormula (Coltène/Whaledent, Inc) composite was placed into the interproximal box and dispensed under pressure until the box was approximately two-thirds full. Synergy NanoFormula was selected because of its new nanofiller technology, which provides superior polishability and wear characteristics, and its duo shade properties, which allow it to visually blend into tooth



Table—Clinical Summary

<p>Preparation</p> <ul style="list-style-type: none"> • Quickly remove old restoration if present and locate decay • Use slow speed to remove decay • Use high speed to redefine preparation • Smooth occlusal margins • Smooth interproximal
<p>Interproximal Fitting</p> <ul style="list-style-type: none"> • Try in and select proper sized Trimax instrument and adjust if necessary • Place rubber dam • Place sectional matrix • Hold matrix and place shortened wedge • Place retaining ring • Try in Trimax instrument again
<p>Interproximal Restoration Placement</p> <ul style="list-style-type: none"> • Perform bonding procedures • Place flowable on floor and sides • Fill box two-thirds full with composite • Place Trimax in one time only and apply pressure down then over • Cure through instrument 20 seconds • Carefully tease instrument out
<p>Occlusal Restoration Placement</p> <ul style="list-style-type: none"> • Line void with flowable • Fill restoration with composite • Cure 20 seconds from buccal and lingual • Remove ring spread matrix and cure 20 seconds from buccal and lingual • Remove band and wedge-cure 20 seconds buccal and lingual • Cure 20 seconds from occlusal
<p>Shaping</p> <ul style="list-style-type: none"> • Shape occlusal with finishing carbides • Shape interproximal with finishing carbide • Mark and adjust occlusion • Place accessory anatomy with finishing carbide • Check interproximal with floss
<p>Finishing and Polishing</p> <ul style="list-style-type: none"> • Use finishing strip in interproximal • Polish with mounted points, cups, discs • Postcure

structure. A P-1 (Ivoclar Vivadent, Inc) resin condenser rounded-point metal instrument was used to spread the composite out toward all interproximal margins, being careful not to pull back the composite and create voids (Figure 11). The light-transmitting contact former was inserted into the interproximal and pushed first apically and then tilted with pressure toward the interproximal (Figure 12). This was done in one motion and the instrument was not removed to avoid pulling back the composite and creating voids at the margins. A brush was quickly painted across the buccal and lingual occlusal areas to blend the composite better into the tooth. The Optilux 501 with Turbo tip (Kerr Corporation) [QA. Correct?] curing light was placed over the end of the light-transmitting contact former and illuminated for 20 seconds (Figure 13).

The contact former was careful-

ly rocked out of the cured composite. A lining of flowable composite was spread into the void created by the contact former. The restoration was then fully built up using composite. A composite placement instrument again was used to direct the composite against the margins of the tooth. The composite was thoroughly cured using 2 curing lights⁵—a Optilux 501 and a L.E.Demetron I (Kerr Corporation) both fitted with Turbo tips—one from the buccal and the other from the lingual for 20 seconds each.

The ring retainer was removed and the matrix band was peeled away from the restored tooth back to the adjacent tooth. The interproximal areas were once again simultaneously cured with 2 lights for 20 seconds from the buccal and the lingual. The matrix and wedge were removed and the interproximal areas were cured again from

buccal and lingual for 20 seconds. By using dual high-output curing lights for a total of 60 seconds in addition to the original 20-second exposure, adequate polymerization was ensured.

Gross shaping of the occlusal area of the restoration was performed using a H379M-018 football-shaped finishing carbide (Brasseler USA). Excess composite that extends beyond the margins must be removed. H246-009 pointed finishing carbides (Brasseler USA) were used to shape the interproximal areas and margins.

Occlusion was evaluated using articulating paper and adjusted with finishing carbide burs. All excursive movements were checked for clearance. Secondary anatomy was carved into the restoration using an H274-018 bur (Brasseler USA) as the occlusion became closer to ideal.

The interproximal contact was evaluated with floss and the gingival margin smoothed with a fine finishing strip. The restoration was smoothed systematically using One Gloss (Shofu Dental Corporation) and D-Fine (Clinician's Choice Dental Products, Inc) pointed polishers and finishers. The restoration was postcured for 40 seconds.

The patient was pleased with the results and reported no postoperative sensitivity. The interproximal contact was firm to floss evaluation. The restoration blended in well visually with adjacent tooth structure and was virtually indistinguishable. A brief clinical summary is given in the Table.

Conclusion

By following a systematic approach combining several instruments, predictable, reliable interproximal contacts can be achieved. Attention to detail and the skill of the operator are important for overall success. In addition, proper case selection greatly affects the outcome. The proper use of appropriate bonding agents and composites helps to decrease postoperative sensitivity and aids in long-term wear and longevity. Experience is paramount. With increased public demand for esthetic restorations, dentists should be training and preparing themselves to be able to

predictably and confidently place direct restorations. ■

References

1. Liebenberg WH. The proximal precinct in direct posterior composite restorations: interproximal integrity. *Pract Periodontics Aesthet Dent.* 2002;14(7):587-594.
2. Albers H. *Tooth Colored Restoratives*. 9th edition. Hamilton ON: BC Decker Inc; 2002: 203-236.
3. Opdam NJ, Roeters JJ, Kujis R, et al. Necessity of bevels for box only Class II composite restorations. *J Prosthet Dent.* 1998;80(3):274-279.
4. Barghi N, Knight GT, Berry TG. Comparing two methods of moisture control in bonding to enamel: a clinical study. *Oper Dent.* 1991; 16(4):130-135.
5. Belvedere P. Controlling shrinkage using TEP: transenamel polymerization. *Dent Today.* 1995;14(4):92-97.

Product References

Product: Composi-Tight
Manufacturer: Garrison Dental Solutions
Location: Spring Lake, Michigan
Phone: 888.437.0032
Web site: www.garrisondental.com

Products: D-Fine, pink contoured wooden wedge
Manufacturer: Clinician's Choice Dental Products, Inc
Location: New Milford, Connecticut
Phone: 800.719.3293
Web site: www.clinicianschoice.com

Products: Non-Latex Flexi-Dam, One Coat, Synergy NanoFormula, Synergy Flow
Manufacturer: Coltène/Whaledent, Inc
Location: Cuyahoga Falls, Ohio
Phone: 800.221.3046
Web site: www.coltenwhaledent.com

Products: H379M-018 football-shaped finishing carbide, H246-009 pointed finishing carbide, H274-018 burs
Manufacturer: Brasseler USA
Location: Savannah, Georgia
Phone: 800.841.4522
Web site: www.brasselerusa.com

Product: Ivory (No. 2 and No. 3) rubber dam clamp
Manufacturer: Heraeus Kulzer, Inc
Location: Armonk, New York
Phone: 800.431.1785
Web site: www.heraeus-kulzer-us.com

Product: One Gloss
Manufacturer: Shofu Dental Corporation
Location: San Marcos, California
Phone: 800.827.4638
Web site: www.shofu.com

Products: Optilux 501 with Turbo Tips, L.E.Demetron I with Turbo Tips
Manufacturer: Kerr Corporation
Location: Orange, California
Phone: 800.537.7123
Web site: www.kerrdental.com

Product: P-1
Manufacturer: Ivoclar Vivadent, Inc
Location: Amherst, New York
Phone: 800.533.6825
Web site: www.ivoclarvivadent.us.com

Product: Trimax
Manufacturer: AdDent, Inc
Location: Danbury, Connecticut
Phone: 203.778.0200
Web site: www.addent.com

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1. Universal success can be achieved through:
 - a. synergistic use of several devices only.
 - b. close attention to detail only.
 - c. synergistic use of several devices coupled with close attention to detail.
 - d. informed consent.
2. Initial access to the carious lesion was done:
 - a. as described by G.V. Black
 - b. from the cervical.
 - c. with the aid of microscope.
 - d. without regard to outline form.
3. The interproximal margins were:
 - a. flared outward.
 - b. flared inward.
 - c. not flared.
 - d. unsupported.
4. The interproximal margins were slightly beveled:
 - a. for esthetics.
 - b. for access.
 - c. to expose the ends of the enamel rods.
 - d. per manufacturer's instructions.
5. As the contact forming instrument tips are single use they can easily be:
 - a. disinfected.
 - b. adjusted by using a sandpaper disc.
 - c. sterilized.
 - d. bend.
6. The wedge was separated so that it:
 - a. fit completely into the interproximal.
 - b. did not protrude beyond the lingual aspect of the tooth.
 - c. did not protrude beyond the buccal aspect of the tooth.
 - d. All of the above
7. Nanofiller technology provides:
 - a. superior polishability.
 - b. (superior) wear characteristics.
 - c. duo shade properties.
 - d. All of the above
8. What was spread into the void created by the contact former:
 - a. a lining of flowable composite.
 - b. bonding agent.
 - c. a thin layer of self-cure composite.
 - d. it was polished smooth.
9. The interproximal areas were cured with:
 - a. 1 light for 20 seconds.
 - b. 1 light for 45 seconds.
 - c. 2 lights for 20 seconds.
 - d. 2 lights for 45 seconds.
10. The interproximal contact was what to floss evaluation?
 - a. Open
 - b. Light
 - c. Firm
 - d. Very tight.

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