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Step-by-Step Handout: Treatment Protocol for Young Patients with Congenitally Missing Maxillary Lateral Incisors

Introduction

This handout provides a comprehensive, interdisciplinary treatment plan for young patients with congenitally missing maxillary lateral incisors (#7 and #10). The long-term goal is replacement with dental implants once skeletal growth is complete. Treatment involves coordination among the restorative dentist, orthodontist, and oral surgeon/implantologist. Key considerations include preserving space, maintaining esthetics and function during growth, monitoring skeletal maturity, and ensuring patient/parent compliance.

The plan emphasizes:

- **Orthodontics:** To create and maintain adequate space for future implants.
- **Prosthetics:** Interim and final restorations.
- **Implant Surgery:** Delayed until growth cessation.
- **Timing and Age:** Implants typically placed after age 18–23 in males; 16–20 in females; earlier interventions focus on space management.
- **Interim Provisionalization:** Fixed options to address esthetics and function.
- **Determining Growth Completion:** Serial radiographs and clinical assessments.

Regular interdisciplinary team meetings (every 6–12 months) are recommended to adjust the plan based on patient progress.

Step-by-Step Treatment Plan

Step 1: Initial Evaluation and Diagnosis (Age 9–10 or earlier)

- **Ideal Age for Initial Screening and Diagnosis:** The optimal age to first look for congenitally missing maxillary lateral incisors is during the early mixed dentition period, typically around ages 7–9 years, when primary lateral incisors exfoliate and permanent incisors are expected to erupt (around age 8–9). Clinical signs, such as retained primary teeth or delayed eruption, should prompt radiographic evaluation (e.g., panoramic radiograph) to confirm agenesis and begin treatment planning. Early diagnosis allows for more treatment options and better long-term outcomes.



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- **Interdisciplinary Team Involvement:** Restorative dentist leads initial assessment; consult orthodontist, prosthodontist, and oral surgeon.
- **Diagnostic Procedures:**
 - **Comprehensive clinical exam,** including occlusion, space analysis, and facial esthetics.
 - **Radiographs:** Panoramic, cephalometric, and periapical views to confirm missing teeth and assess root development of adjacent teeth (canines and central incisors).
 - **Study models or intraoral scans** for space measurement (ideal implant space: 6–7 mm mesiodistally, 5–6 mm buccolingually).
 - **CBCT** if needed for bone volume assessment (minimize radiation exposure in children).
 - **Orthodontic Instructions:** Evaluate for malocclusion (e.g., Class II/III, crowding). If canines are erupting into lateral spaces, plan for distalization.
 - **Prosthetic Instructions:** Assess need for immediate interim restoration if esthetics are a concern (e.g., visible gaps affecting self-esteem).
 - **Implant Surgery Instructions:** No immediate action; note baseline bone height/width for future planning.
 - **Timing:** Complete within 3–6 months of presentation.

Step 2: Orthodontic Space Management (Age 10–14)

- **Interdisciplinary Team Involvement:** Orthodontist leads; coordinate with restorative dentist for monitoring.
- **Orthodontic Instructions:**
 - **Initiate comprehensive orthodontics** if indicated (e.g., full braces or clear aligners).
 - **Open space for missing laterals:** Aim for 6–7 mm per side to accommodate standard implants (3.5–4 mm diameter) plus crown. Instruct orthodontist to slightly shallow out overbite in order to allow room for lingual wings of future Maryland bridge with little preparation.
 - **Use space maintainers** if orthodontics is delayed (e.g., lingual arch or Nance appliance).
 - **Avoid closing spaces** unless patient/parents opt out of implants (alternative: canine substitution).
- **Monitor eruption** of permanent canines and premolars.



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- **Prosthetic Instructions:** If space is opened, prepare for interim provisionalization (see Step 3).
- **Implant Surgery Instructions:** Annual CBCT or radiographs to monitor alveolar bone development; avoid any bone grafting until growth nears completion.
- **Timing:** Orthodontic treatment typically lasts 18–24 months; align with pubertal growth spurt (around age 11–13 in males).

Step 3: Interim Provisionalization (Age 10–18)

- **Interdisciplinary Team Involvement:** Restorative dentist leads; involve orthodontist for appliance compatibility.
- **Prosthetic Instructions:**
- **Options based on age and compliance:**
- **Fixed:** Resin-bonded bridge (Maryland bridge) using adjacent teeth as abutments; preferred for older children (age 12+) to prevent space collapse.
- **Orthodontic Integration:** Pontics on orthodontic archwire during treatment.
- **Fabricate with esthetic materials (e.g., composite or porcelain); ensure occlusion is balanced to avoid supraeruption of opposing teeth.**
- **Replace/adjust every 1–2 years as facial growth changes dimensions.**
- **Orthodontic Instructions:** Ensure provisional devices do not interfere with tooth movement.
- **Implant Surgery Instructions:** No action; focus on preserving bone via space maintenance.
- **Timing:** Initiate post-orthodontic space opening; maintain until implant placement.

Step 4: Monitoring Growth and Determining Completion (Age 14–21)

- **Interdisciplinary Team Involvement:** All team members; oral surgeon monitors bone.
- **Methods to Determine Growth Completion:**
- **Clinical Assessment:** Track height, shoe size, and secondary sexual characteristics (e.g., facial hair in males); growth typically slows by age 16–18.



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- **Radiographic Evaluation:** Serial cephalometric radiographs (every 6–12 months) to assess superimposition—stable cranial base and mandibular length indicate cessation.
- **Hand-Wrist Radiographs:** Use to evaluate skeletal maturity (e.g., via Fishman Skeletal Maturity Indicators); full maturity when epiphyseal plates fuse (around age 18–21 in males).
- **Cervical Vertebral Maturation (CVM):** Stages 5–6 on lateral cephalograms confirm post-pubertal stability.
- **Bone Age Assessment:** Consult endocrinologist if needed for delayed growth.
- **Orthodontic Instructions:** Retention phase post-treatment; use fixed retainers to maintain space. **Important! Orthodontic hardware is never to be removed until patient is examined by surgeon and restorative dentist to ensure proper occlusion and spacing.** See release form.
- **Prosthetic Instructions:** Continue interim maintenance; evaluate for wear or esthetic updates.
- **Implant Surgery Instructions:** Annual CBCT to monitor bone volume; if deficient, plan grafting.
- **Timing:** Begin intensive monitoring at age 14; confirm growth cessation before proceeding to implants (typically age 18+; delay if active growth persists).

Step 5: Implant Placement and Final Restoration (Age 18–21+)

- **Interdisciplinary Team Involvement:** Oral surgeon leads surgery; restorative dentist for restoration.
- **Implant Surgery Instructions:**
- **Confirm growth completion** via methods in Step 4.
- **Preoperative CBCT for 3D planning;** ensure adequate bone (if not, perform bone grafting 3–6 months prior).
- **Place endosseous implants** (e.g., 3.5–4 mm diameter, 10–13 mm length) in #7 and #10 positions.
- **Use guided surgery for precision;** consider immediate provisionalization if primary stability is achieved.
- **Healing time:** 3–6 months for osseointegration.



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- **Prosthetic Instructions:**
 - Fabricate implant-supported crowns (e.g., screw-retained or cement-retained). **Provisionalization may be needed accompanied with tissue shaping for proper esthetics.**
 - Ensure esthetic harmony with adjacent teeth (custom abutments if needed).
 - Final occlusion check; provide nightguard if bruxism is present.
- **Orthodontic Instructions:** If minor adjustments needed post-implant, use aligners (implants are anchorage units).
- **Timing:** Surgery after growth confirmation; restoration 3–6 months post-surgery.

Step 6: Long-Term Follow-Up (Ongoing)

- **Interdisciplinary Team Involvement:** All members for annual reviews.
- **Instructions:**
 - Monitor implants for peri-implantitis, occlusion, and esthetics.
 - Radiographs every 1–3 years.
 - Adjust for any occlusal changes.
- **Timing:** Lifelong, starting 6 months post-restoration.

Patient and Parent Instructions Throughout the Process

Educate patient and parents at each visit using simple language, visuals, and written summaries. Emphasize compliance to avoid complications like space loss or bone resorption.

- **General Instructions:**
 - Attend all appointments; treatment spans 10+ years.
 - Maintain excellent oral hygiene: Brush twice daily, floss, use fluoride toothpaste/rinse to prevent decay on adjacent teeth.
 - Avoid hard/chewy foods that could damage interim devices or orthodontics.
 - Report issues immediately (e.g., loose appliance, pain).
- **During Orthodontics (Age 10–14):** **Be sure to explain proper age for implants and the necessity of not proceeding too soon.**



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- **Wear elastics/retainers as instructed; non-compliance can close spaces.**
- **Parents: Supervise brushing around braces; schedule regular cleanings.**
- **Patient: Be patient with esthetic changes—gaps will be filled later.**
- **During Interim Provisionalization (Age 10–18):**
- **For fixed bridges: Avoid sticky foods; floss under pontics.**
- **Parents: Monitor for bullying/self-esteem issues; discuss with team if psychological support needed.**
- **Patient: Follow care instructions for devices to ensure best esthetics and function.**
- **During Growth Monitoring (Age 14–21):**
 - **Track personal growth (e.g., height); inform team of changes.**
 - **Avoid habits like thumb-sucking or tongue-thrusting that affect occlusion.**
 - **Parents: Encourage healthy diet for bone development (calcium, vitamin D).**
- **Pre- and Post-Implant Surgery (Age 18+):**
- **Follow pre-op instructions (e.g., antibiotics if prescribed).**
- **Post-op: Soft diet for 1–2 weeks; ice packs for swelling; no smoking/vaping (delays healing).**
- **Patient: Understand implants are permanent but require lifelong care.**
- **Parents: Support recovery; transition responsibility to patient as they age.**
- **Long-Term:**
- **Annual dental visits; professional cleanings every 6 months.**
- **Report any changes (e.g., gum inflammation).**
- **Patient: As an adult, maintain hygiene to ensure implant longevity (success rate >95% with care).**

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