

Pediatric Prosthodontic Needs and Interventions at a Tertiary Children’s Hospital: A 10-Year Retrospective Study

Jake Cantrell, DMD, MS and Aram Kim, DMD, MS, FACP · Boston Children’s Hospital and Harvard School of Dental Medicine



BACKGROUND

Children with congenital or acquired conditions such as ectodermal dysplasia, amelogenesis imperfecta (AI), dentinogenesis imperfecta (DI), cleft lip/palate, tumors, and dental trauma often have substantial, evolving prosthodontic needs. Contemporary guidance emphasizes early initiation, staged revision with growth, and multidisciplinary coordination.^{1,2} Prosthodontic interventions, from removable prostheses for oligodontia to full-coverage crowns in AI/DI and select implant-supported options in adolescents, help restore function, limit wear, and improve esthetics and psychosocial outcomes.³⁻⁵ In the mixed dentition, definitive care typically requires sequencing across disciplines to manage space, arch form, interarch relationships, and occlusion.^{1,2}

Despite this need, access remains limited by behavioral and medical complexity, caregiver capacity, finances/insurance, and provider availability.⁶ Unlike established early “check-in” points in pediatric oral health (AAPD: first dental visit by eruption/≤12 months; AAO: orthodontic evaluation by age 7),^{7,8} there is no consensus benchmark for when medically/dentally complex children should first be evaluated by a prosthodontic team. This 10-year retrospective (2014–2024) at Boston Children’s Hospital quantifies needs, referrals, and outcomes to elucidate earlier and coordinated prosthodontic care.

METHODS

A retrospective chart review was conducted of patients referred for prosthodontic consultation at Boston Children’s Hospital (BCH) between 2014 and 2024 (BCH IRB P00049540). Data were extracted from electronic health records and billing systems, including Dentrix, PowerChart, and Epic. Variables included documented patient demographics, medical and dental diagnoses, referral sources, reasons for referral, and proposed and rendered treatments. Data were analyzed descriptively to identify referral trends, treatment patterns, and barriers to treatment completion.

PATIENT DEMOGRAPHICS

	Total N = 517	Characteristic	N (%) / Value
Age at First Prosthodontic Consult	Mean	15.8 years	
	Median	16 years	
	Range	3-35 years	
	Age 0-5 years	9 (1.7%)	
	Age 6-12 years	97 (18.8%)	
	Age 13-18 years	291 (56.3%)	
	Age >18 years	120 (23.2%)	
Gender	Female	271 (52%)	
	Male	246 (48%)	
Insurance Coverage	No Insurance/Self-Pay	23 (4.4%)	
	Medicare	17 (3.3%)	
	Medicaid	243 (47%)	
	Private Insurance	234 (45.3%)	
Common Conditions/Diagnoses	Partial Edentulism	287 (56%)	
	Complete Edentulism	21 (4.1%)	
	Malocclusion	109 (21.1%)	
	Dental Trauma	88 (17%)	
	Cleft Conditions	84 (16.2%)	
	Tumor/Neoplasm	33 (6.4%)	
	AI/Generalized Enamel Hypoplasia	21 (4.1%)	
	Maxillary/Mandibular Hypoplasia	16 (3.1%)	
	Ectodermal Dysplasia Phenotype	20 (3.9%)	
	DI/Osteogenesis Imperfecta	14 (2.7%)	
	Trisomy 21	12 (2.3%)	

Table 1. Summary demographics of 517 patients referred for prosthodontic consultation, including age at first visit, gender, insurance coverage, and common conditions/diagnoses.

RESULTS

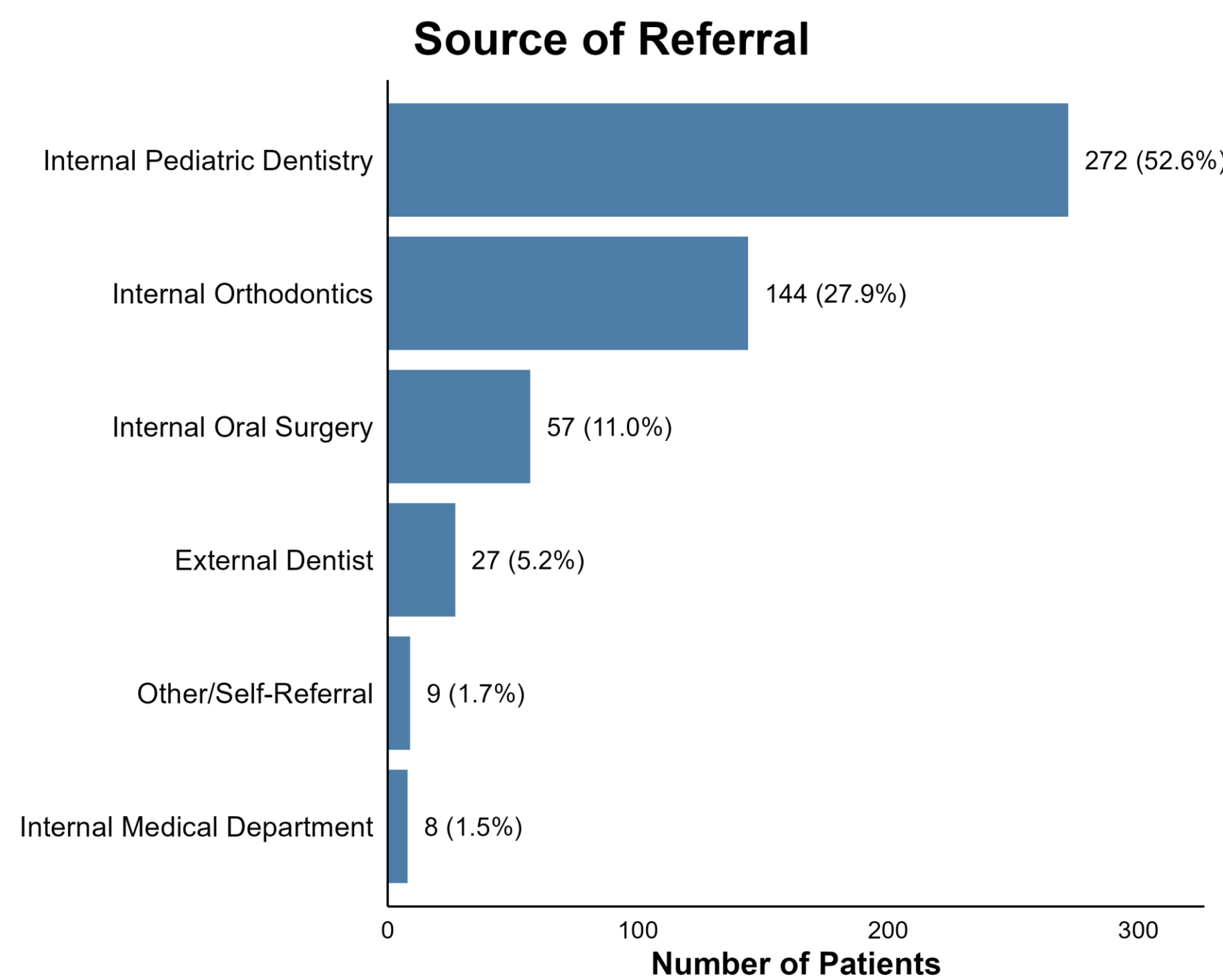


Figure 1. Patients per referral source. >50% of referrals from Pediatric Dentistry, followed by Orthodontics (27.9%) and Oral Surgery (11%).

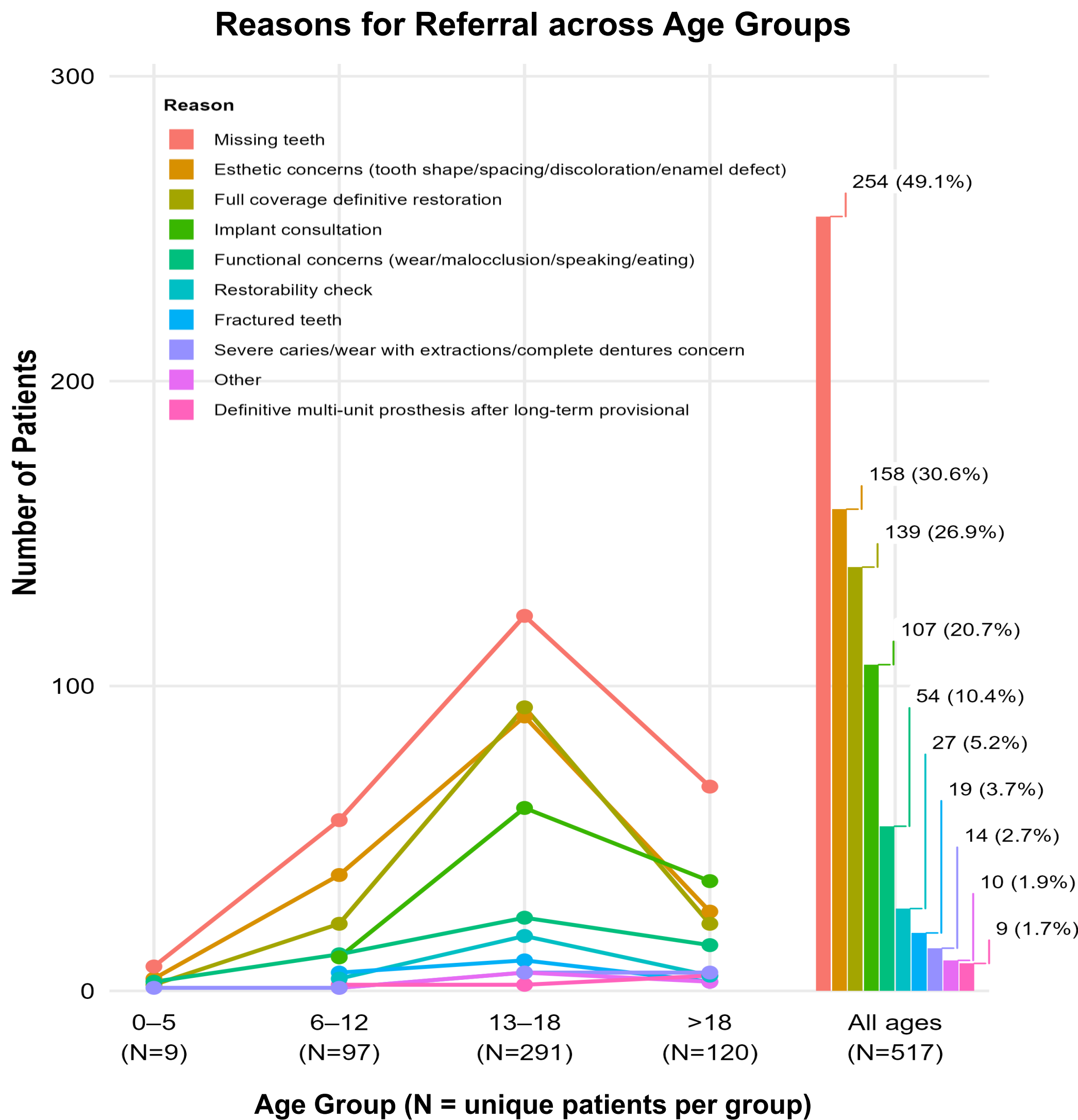


Figure 2. Reasons for Referral. Across the cohort, missing teeth was the leading indication (254; 49.1%). This can be subdivided to 1-2 missing teeth (135; 26.1%), ≥3 missing teeth (98; 19%), and full arch edentulism (21; 4.1%). With increasing age, implant consultation increased, surpassing esthetic concerns to become the second most common reason in the >18 years group. Other frequent indications included esthetic concerns (158; 30.6%) with 85/16.4% due to tooth morphology such as peg laterals, 47/9.1% due to teeth spacing, and 32/6.2% due to teeth discoloration.



Figure 3. Representative Case. Before and after photographs show rehabilitation with maxillary and mandibular removable complete dentures in a pediatric patient with ectodermal dysplasia (photos from Dr. Aram Kim).

Proposed Treatments

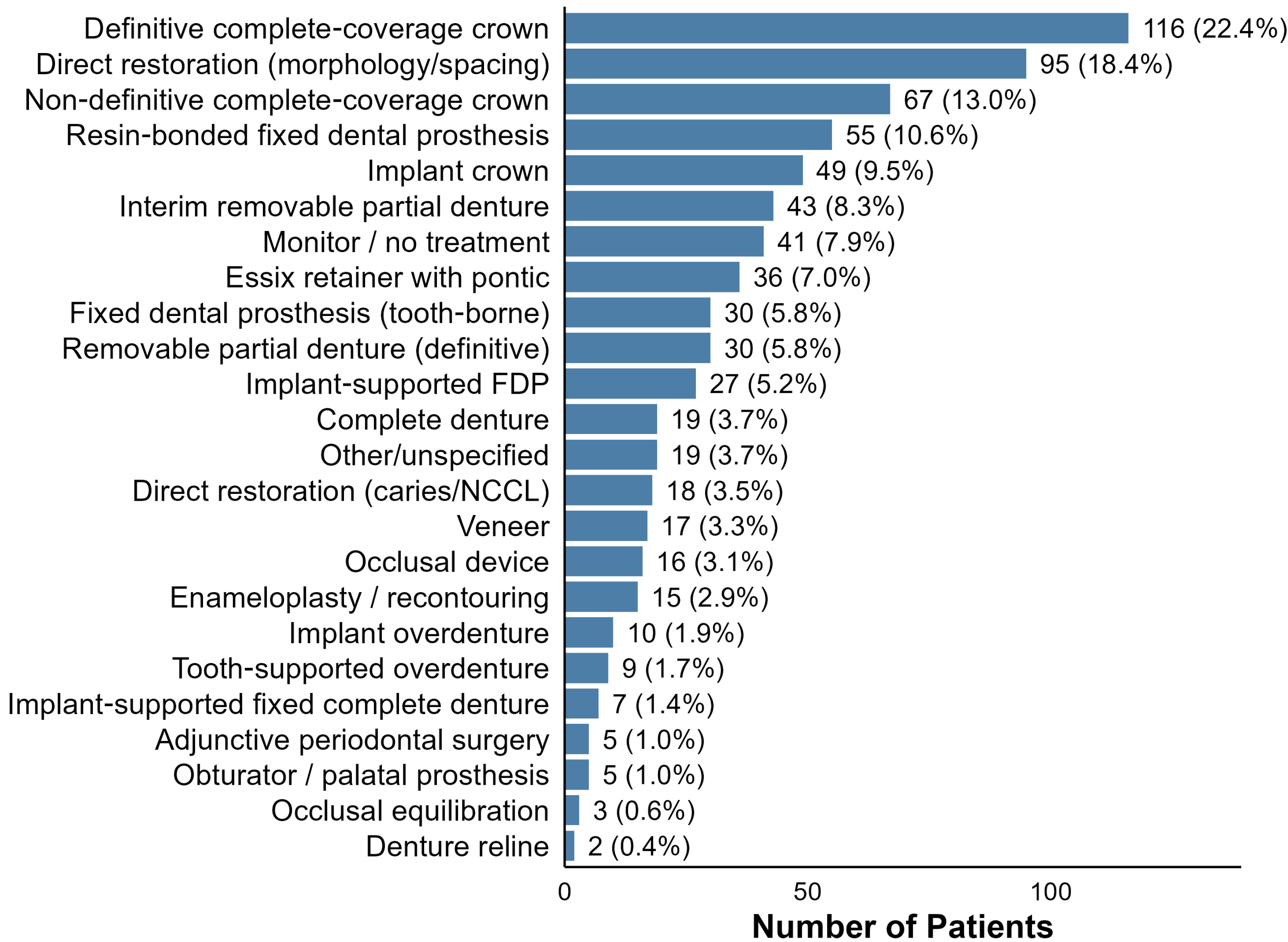


Figure 4. Proposed prosthodontic treatments (N = 517). The most frequently proposed interventions were definitive complete-coverage crowns (116 or 22.4% of patients), direct composite additions for tooth morphology/spacing (95/18.4%), and non-definitive full coverage crowns (67/13%). Resin-bonded fixed dental prostheses (55/10.6%) and interim removable partial dentures (43/8.3%) were also common, reflecting the emphasis on conservative and growth-appropriate options. More complex implant-supported prostheses were still present but less often proposed in this pediatric/adolescent cohort. “Monitor/no treatment” proposals typically represented conservative treatment, planned staging during growth, or orthodontic sequencing.

DISCUSSION

This cohort underscores a distinct pediatric and adolescent need for prosthodontic care. One in five patients (20%) were elementary-school age with mixed dentition, a developmental phase in which children seek a normative appearance as they enter school and engage in activities with higher risks of orofacial trauma. More than half of the cohort were teenagers (13–18 years), a period when appearance exerts greater social and psychological impact and demand for esthetic and functional rehabilitation increases.

Diagnostic profiles further highlight the uniqueness of this population. Dental trauma was present in 17% of patients, a much higher prevalence than typically seen in adult prosthodontic referrals, reinforcing the importance of early prosthodontist involvement in both immediate esthetic replacement and long-term management of partial edentulism. Cleft conditions (16.2%) and malocclusion (21.1%) were also common, reflecting frequent overlap between prosthodontics, orthodontics, and surgery in care coordination. Importantly, 6.4% of patients had tumors or neoplasm-related diagnoses. With childhood cancer survival improving, prosthodontists play a critical role in addressing the late effects of chemotherapy and radiation and supporting lifelong functional rehabilitation. Smaller but clinically significant subsets included patients with amelogenesis imperfecta/generalized enamel hypoplasia (4.1%), ectodermal dysplasia phenotypes (3.9%), and dentinogenesis imperfecta/osteogenesis imperfecta (2.7%), each requiring tailored prosthodontic strategies. Payer mix was evenly split between Medicaid and private/self-pay. Medicaid’s relatively broader pediatric dental coverage may facilitate access at younger ages, while the sizeable share of privately insured or self-pay patients indicates demand across socioeconomic strata.

Across indications, proposed care spanned the full spectrum of contemporary prosthodontics. There was a predominance of conservative and interim modalities appropriate to growth—resin-bonded fixed dental prostheses, interim removable partial dentures, direct additive composite for tooth form and spacing, and non-definitive complete-coverage crowns—while multi-unit implant-supported prostheses were less commonly proposed in this age range. Although many referrals in our center were internal, the pattern that most referrals came from pediatric dentistry and orthodontics is broadly generalizable; proactive collaboration and outreach to these specialists can expand timely access in private-practice and hospital settings alike.

Limitations include the single-center design and heterogeneity in documentation (e.g., “monitor/no treatment” may reflect planned staging during growth). Future work should include multi-center cohorts with standardized data elements and evaluate the effect of coordinated care pathways on initiation, time to definitive treatment, and patient-reported esthetic/psychosocial outcomes.



Figure 5. Representative Cases. Pre-operative and post-operative intraoral photos showing replacement of lateral incisors (#7, #10) with resin-bonded FDP (top two photos) and comprehensive oral rehabilitation for amelogenesis imperfecta using full coverage crowns on all teeth (bottom two photos).

CONCLUSION

In this 10-year, single-center cohort study (N=517), 20% of patients were ≤12 years (mixed dentition) and >50% were 13-18 years. Referrals for prosthodontic care originated primarily from pediatric dentists (52.6%), followed by orthodontists (27.9%) and oral surgeons (11%), most often for management of tooth absence, esthetic concerns, and restoration of compromised permanent dentition. A broad range of contemporary prosthodontic treatment modalities was proposed, with greater emphasis on interim and conservative options—such as resin-bonded fixed dental prostheses, interim removable partial dentures, and non-definitive complete-coverage crowns. Collectively, these findings highlight the demand and clinical indications for prosthodontic care in pediatric and adolescent populations and delineate principal referral pathways. Strengthening collaboration with pediatric dentists and orthodontists can increase awareness of prosthodontic options and facilitate timely referral so that patients receive needed care.

REFERENCES

1. Pace-Balzan A, Chatzipantelis A, Dunn KJ, Charan G, Ashley MP. Restorative dentistry clinical decision-making for hypodontia: complex cases. Br Dent J. 2023;235(7):489-495. doi:10.1038/s41415-023-6324-5
2. Dougherty F, Pillai S, Hamill D, Amin N, Ashley MP. A service evaluation of the multidisciplinary team approach to hypodontia. Br Dent J. 2023;235(7):514-519. doi:10.1038/s41415-023-6385-5
3. Sapir S, Shapira J. Dentinogenesis imperfecta: an early treatment strategy. Pediatr Dent. 2001;23(3):232-237.
4. de Alencar NA, Reis KR, Antonio AG, Maia LC. Influence of oral rehabilitation on the oral health-related quality of life of a child with ectodermal dysplasia. J Dent Child (Chic). 2015;82(1):36-40.
5. American College of Prosthodontists. Dental Management of Persons with Ectodermal Dysplasia: Position Statement. Chicago, IL: American College of Prosthodontists; Published October 4, 2016. Accessed September 14, 2025. https://www.prosthodontics.org/assets/1/7/Dental_Management_of_Persons_with_Ectodermal_Dysplasia.pdf
6. American Academy of Pediatric Dentistry. Management of dental patients with special health care needs. In: The Reference Manual of Pediatric Dentistry. Chicago, IL: American Academy of Pediatric Dentistry; 2024:343-350.
7. Sapir S, Shapira J. Dentinogenesis imperfecta: a early treatment strategy. Pediatr Dent. 2001;23(3):232-237.
8. American Association of Orthodontists. Age 7 Orthodontic Visit: Why It’s a Milestone. Published May 15, 2023. Accessed September 14, 2025. https://aaoinfo.org/whats-trending/when-should-my-child-see-an-orthodontist-age-7/