

## Review Article

# Influence of Medical Case History in the Orthodontic Diagnosis and Treatment Planning: A Review

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## Abstract

Most significant and often neglected part of diagnosis and treatment planning in orthodontics is medical case history recording. It is significant because it provides information regarding current health status, and its influence on periodontal tissue remodeling. Several diseases which require long term drugs may predispose teeth to iatrogenic root resorption following application of a mechanical stimulus such as application of orthodontic forces.

Few situations during case history recording patient hesitate to reveal realistic medical history in presence of some sexually transmitted disease.

Main of this paper presentation is to provide comprehensive knowledge regarding rationale behind recording medical case history, also influence of systemic disorders in orthodontic treatment planning.

**Keywords:** Case History; Diagnosis; Orthodontics; Tissue Remolding; Root Resorption; Mechanical

## Introduction

Case history means process of gaining information by dentist / orthodontist through asking specific questions, either of the patient or of other people who know the person and can give suitable information with the aim of obtaining information useful in formulating a diagnosis providing accurate [1].

A medical history is significantly important tool to evaluate current health status, and also to identify medical disorders medications, this may influence paradental tissue remodeling (Krishnan and Davidovitch, 2006) and consequently, tooth movement [1].

Several studies done on effect of long term drugs used in chronic asthma have been concluded that these drugs may predispose teeth to iatrogenic root resorption following application of a mechanical stimulus (McNab et al., 1999). Furthermore, taking long term drugs may affects bone metabolism, also alter the inflammatory pathways resulting in to alter in orthodontic treatment plan [2].

In few situations patient hesitate to reveal realistic medical history in presence of some sexually transmitted disease; it is always safe to have comprehensive knowledge to judge from the manner, attitude, and the existing health status of the patient. Hence it helps in further investigations and/ or precautions are warranted before and/ or during treatment [3].

In healthy patient nutritional balance plays vital role, hence several studies have reported that growth factors affecting growth on the basis of braech of nutritional balance may result in Nutritional imbalances, developmental disorders, and skeletal malformations, chronic diseases, liver dysfunctions, renal impairments, cardiac and pulmonary anomalies, and erosive joint diseases can all impact physiological growth [4].

Through this paper I would like to present significance of medical case history and its influence in orthodontic treatment plan.

## Development and Genetic Role

Neural crest cells are called master of orchestra of facial development as it gives rise to branchial arches. These branchial arches give rise to craniofacial unit (Sperber et al., 2001). However, (Finkelstein et al., 2001) suggested that 6th and 12th week of intrauterine life is considered to be more risky for craniofacial development most of craniofacial anomalies may occurs.

Most of the defects are due to iatrogenic etiological factors. However, in the light of newer research, many of the unknown causes have been identified, and now multifactorial etiology is considered the commonest cause of congenital defects, whereas isolated genetic defects have been described in 10–30% of cases (Kumar, 2008). Orthodontists are the active member of craniofacial unit may often come across embryonic developmental defects, such as cleft of lip, palate micro/macrogathia and facial dysplasias. It is moral responsibility for orthodontist to recognize the basic features of a congenital defect or genetic defect.

Several reviewers have been reported regarding identification of clinical features can be done often as Facial features such as sparse hair on the head, frontal bossing, depression of the nasal bridge, telecanthus, low-set ears, typical epicanthal folds, coloboma, defects of the external ear, and facial clefts are characteristic features seen in many craniofacial syndromes. On thorough extraoral and intraoral examination can reveal vital information of an underlying syndrome/ congenital deformity.

Genetic legacy can follow a diversity of patterns of expression across generations. Hence, it is recommended that orthodontist should able to identify to identify the role of genetics and delineate it from the environmental influences. Most commonly genetic defects and gene role can be identified by familial comparisons, pedigree analysis, and sometimes, simple cephalometric analysis [1-5].

## Infections (Systemic and Local)

Many studies have revealed that development of cranial complex can be affected by several systemic diseases in either direct or indirect way during prenatal and postnatal stages of growth and development.

Acute prenatal infections such as Rubella, Cytomegalovirus, and Herpes simplex makes offspring vulnerable to develop congenital defects including facial clefts. Chronic prenatal disease like congenital syphilis may have tendency to contribute various orofacial malformations such as saddle nose, depressed nasal bridge, and hyperplasia of the molars and incisors.

In general chronic systemic infections like tuberculosis, hepatitis, nephritis, and HIV may indirectly contribute to a malocclusion by causing disruption in systemic growth during childhood.

In natal infection may cross contaminate disseminating via blood either acute infection or chronic child may susceptible to develop enamel hyperplasia osteomyelitis (Fabe, 1950; Carek et al., 2001), and resulting demolition of the bone architecture and/or growth disturbance.

Similar studies done (Hadlock et al., 2001; Semlali et al., 2004; Prasad et al., 2007) on spread of local infection from structures adjacent to temporomandibular joint (TMJ) such as mastoid process (mastoiditis), internal auditory meatus (otitis media) may leads to arthrosis, adhesions, and regressive changes within the joint, which may affect growth and function of the mandible.

Several systemic infectious disease and local acute and chronic infections present clinically similar features such as aphthous ulcerations, aerobic and anaerobic infections of the oral cavity may be effectively managed by the well-trained orthodontist. Furthermore, similar features are seen in infectious disease like infectious mononucleosis, mumps, measles, tuberculosis, HIV, and leukemia may also have similar oral manifestations; it becomes extremely important to differentiate local lesions from lesions that are signs of major systemic conditions can be managed by physician. Thus, it is always safe to work as team and collaborate with physician to avoid the risks associated with spread of disease and complications that may arise during orthodontic treatment [1-8].

## Nutrition Deficiency

Studies have been demonstrated that low calcium and vitamin supplementations like to show reduced weight and reduced craniofacial dimensions. Thus the development their development is influenced by the availability of essential nutrients (Engström et al., 1982a,b).

Children fed malnutrition early in their life show decrease height and head size (Krueger 1969; Alvear et al., 1986). However, subsequent supplementation of nutrition may compensate for early retarded growth to normal growth, this phenomenon called as catch-up growth (Garrow and Pike, 1967; Graham and Adrianzen, 1972). Furthermore, chronic malnutrition leads to slow down metabolic rate, skeletal maturation, and delayed on set of menarche. Orthodontist must diagnose these cases showing class II malocclusion with altered periodontal response to orthodontic force (Collins and Sinclair, 1988) [1-11].

## Endocrinology

The endocrine system is complex networks that controls and regulate physiologic process. Distraction in this network system results in extensive alterations in physiology, resulting in metabolic, anatomical, and/or growth-related disturbances [1-18].

### Pituitary Gland

This gland controls and regulates endocrine system also it imparts vital role in development of physical and mental status of growing child (Setian, 2007; Cantu et al., 1997; Van Erum et al., 1998). Therefore, instability of the pituitary function (and that of hypothalamus) is associated with modification of function of most other endocrine glands.

Clinical feature of decrease growth hormone manifestations reduced stature and reduced growth can be expressed as a retrognathic maxilla and mandible and shortened cranial base length (Van Erum et al., 1998) [1-19].

### Respiratory System

Respiratory system divided in to two, upper and lower respiratory system. Upper respiratory system comprises of airway space in the nose, pharynx, and the larynx. Lower respiratory system comprises of lungs, bronchus. Chronic restriction of the nasal airway due to sinusitis, tonsillitis, adenoiditis, and allergic rhinitis leads to mouth breathing, and further to the classic adenoid facies as well as a change in the craniofacial flexure.

Disorders of the lower airway, such as asthma, chronic bronchitis and other chronic pulmonary diseases increase the breathing effort and affected cases may display orofacial changes similar to those seen with mouth breathing, apart from consequences related to impaired general health due to low oxygenation of the blood (Laurikainen and Kuusisto, 1998; Davidovitch and Krishnan, 2009) [1-20].

### Cardiovascular System

Patients with congenital heart disease and valvular defects often have poor general health, retarded physical growth, increased susceptibility to infections, such as infective endocarditis, and are at a high risk of bleeding (if on anticoagulants). In general, patients with mild valvular dysfunction are able to tolerate dental procedures well, but patients with mitral regurgitation are particularly susceptible to exacerbation of pulmonary edema and acute shortness of breath (Warburton and Caccamese, 2006) [1-21].

The liver is chief storehouse of metabolism; other major functions of liver are synthesis of clotting factors, formation of Biel salts, urea and detoxification of drugs. Thus, liver controls and regulate various physiological functions of body. Breach in liver function causes extensive alterations in body such as growth failure, edema due to loss of plasma proteins, portal hypertension, variceal bleeding, hypersplenism, coagulopathy, and susceptibility to infections, as well as renal, pulmonary, and neurological complications [1-22].

### Neuromuscular

Under the synchronizing effect of neuromuscular system, Muscle of mastication controls and regulate development of orofacial structures including occlusion and function such as mastication,

deglutition, speech, and respiration. An inflammatory or pathological alteration such as cerebral and cranial nerve palsies in neuromuscular system causes loss of muscle tone, consequently imparts imbalance of forces and adaptation of the skeletal structures in development of craniofacial skeleton.

Seizures is chronic and most common neuromuscular system may manifests altered mental status and poor oral hygiene also, body asymmetry including forehead and facial structures. (Tinuper et al., 1992; Sheller, 2004; Sheth, 2004), these patients are on long-term drug therapy may susceptible to develop gingival hyperplasia, and bone mineral loss [1-23].

## Psychiatric Disorders

In current situation most of the orthodontic patients are children and young adults at different stages of maturation, with rapid and drastic changes taking place, both in their minds and bodies.

There are two most commonly associated with psychiatric disorders often encountered by orthodontist. Depressive disorder (MDD) or attention deficit hyperactivity disorder (ADHD) (Neeley et al., 2006a).

These patients may be under treatment with amphetamines such as methylphenidate, which predisposes them to xerostomia, dysphagia, sialoadenitis, stomatitis, bruxism, and growth disturbances (Elia et al., 1999). It is important for orthodontist to know that these patients are non-compliance with poor oral hygiene, difficulty in understanding instructions in placement of elastics at home, often neglect appointments can lead to treatment failure [1-29].

## Conclusion

It is always safe to know the, pretreatment evaluation of the patient must include questions about prior or current illness and medication. Most of the researcher reports that a 15-20% child expresses clinical systemic disorders at the age of 16 years, most of orthodontic treatment starts at similar age group. Hence it is recommended that orthodontist must record medical case history. It is always better to know more than what I have presented in my paper.

Thus, through this paper I suggest that reader must try to evaluate other treatment modality than what I have written.

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