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RESEARCH ARTICLE

SUPERNUMERARY TEETH-REVIEW OF PREVALENCE AND CHARACTERISTICS. PART I.

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Abstract

Supernumerary teeth are defined as an excess in the number of teeth when compared to the normal dental formula. Supernumerary teeth are not an uncommon anomaly with a prevalence range of 0.15 to 3.8 percent. They occur more frequently in the permanent than in the primary dentition and in males more frequently than in females. They can occur almost anywhere in the mouth and may exist unilaterally or bilaterally, but the upper incisor region has been reported as the region most frequently affected by supernumerary teeth. Supernumerary teeth can be classified according to form or shape, location, time of appearance, extent of eruption and position of supernumerary teeth, and severity of the condition. They present with different severities, but multiple supernumerary teeth are found to be rare especially of cases with more than 2 supernumeraries.

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Main Text:-

Prevalence:-

There have been many case reports concerning supernumerary teeth, but only a few frequency studies have been undertaken (Table 1).¹⁻²⁴ Supernumerary teeth are not an uncommon anomaly. They occur more frequently in the permanent than in the primary dentition and in males more frequently than in females.^{18, 20, 21, 24-31} It has been shown from studies on Caucasian children that males were affected approximately twice as often as females in the permanent dentition,^{18-21, 23, 32, 33} whereas the male: female ratio in the Mongoloid populations appeared to be much higher. Saito²⁶ and Tayet al.²⁹ found this ratio to be 5.5:1 in their studies on Japanese and Hong Kong schoolchildren respectively. In addition, Davis²⁴ reported the male: female ratio to be 6.5:1 in his study on Hong Kong schoolchildren. Parry and Iyer¹¹ found in Indian orthodontic patients a gender prevalence ratio of 1.83:1.

The frequency of supernumerary teeth has been reported to be in the range of 0.15 to 3.8 percent for various populations,^{1, 16, 17, 20, 31, 34-36} with higher figures in Hispanic population with a prevalence range between 2 to 2.65 percent^{37, 38} and Mongoloid racial groups, where the prevalence was around 3 percent.^{14, 24}

It appears from the literature that the frequency varies considerably. The differences to a large degree can be attributed to differences in methods of investigation, sampling techniques (particularly differences in the ages of the subjects) and racial derivation of the groups examined. This agrees with Brook³⁹ who ascribed a proportion of the differences found in published prevalence studies of dental anomalies of number, form and size to these factors. Certain regions of the dentition have been investigated by some authors, whereas others have investigated only those

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supernumerary teeth that were erupted. Stafne,¹Niswander and Sujaku¹⁴ and Brook²⁰ found that only one quarter of permanent supernumerary teeth were erupted. Underestimation of prevalence may occur if studies do not include radiographic examination for unerupted supernumeraries.

Characteristics Of Supernumerary Teeth:-

Form or shape:-

Supernumerary teeth can be classified morphologically as similar to the regular teeth in their shape and size (supplemental) or completely different (rudimentary).^{35,40} Supplemental supernumerary teeth (eumorphic or also referred to as incisiform) defines teeth of normal form including both size and shape. They can be found in both dentitions. In the permanent dentition they are most frequently found as maxillary and mandibular supernumerary lateral incisors,²⁰ whereas in the primary dentition they are more likely to arise as supernumerary upper central incisors. Supplemental supernumerary teeth can be found as premolars and molars particularly in African and Asian populations.⁴¹ In most cases it is difficult to distinguish between the two teeth, the supplemental and the original one. Rudimentary (or dysmorphic) teeth are abnormal in shape and size (usually smaller than normal) and they can be either conical, tuberculate, molariform or odontome in shape.

Conical: This is the most common supernumerary tooth, usually found in the premaxilla and is shaped as described. It has a complete root formation and can be erupted or impacted, normally positioned or inverted. It has little effect on the eruption of the adjacent teeth but may affect their position.

Tuberculate: This is usually barrel-shaped, with an incomplete root. It is also frequently found in the premaxilla palatally and tends to delay the eruption of the adjacent teeth.

Molariform: This has a form similar to a premolar.

Odontome: This is a calcified mixed odontogenic tumour and can present as a compound odontome which appears as multiple miniature teeth, or a complex odontome which appears as an amorphous conglomerate of hard tissue.

Howard⁴² suggested a classification of supernumerary teeth, similar to the above, on the basis of their shape and divided supernumerary teeth into four categories:

- Conical: small, peg-shaped (coniform) teeth usually with normal root (complete root).
- Tuberculate (multicusped): short, barrel-shaped teeth with a normal looking crown, or invaginated, but having a rudimentary root (incomplete root).
- Odontomes, having no regular shape
- Incisiform teeth, which closely resemble adjacent teeth.

DiBiase⁴³ and Foster and Taylor⁴⁴ classified supernumerary teeth in the upper central incisor region according to their morphological features as conical or tuberculate in shape. The conical form was the most common.

Parry and Iyer¹¹ classified 50 cases with supernumeraries in the maxilla on the basis of their shape and size and their findings were: 38 conical (20 small, 17 medium and 1 large) and 12 supplemental (2 medium and 10 large).

Out of 100 cases of supernumerary teeth treated at the Dental Hospital in Sheffield, Gardiner¹⁰ found 23 cases had supplemental teeth, 74 conical or multicuspid and 3 cases had both supplemental and supernumerary teeth. Koch et al.⁴⁵ recorded 56 percent conical, 12 percent tuberculate, 11 percent supplemental and 12 percent other shapes in a study of indications for surgical removal of supernumerary teeth in the premaxilla.

Tooth location:-

Supernumerary teeth can occur almost anywhere in the mouth and may exist unilaterally or bilaterally.

Left and right side differences:-

There appears to be no consistent results regarding the occurrence of supernumerary teeth between the left and right sides. In Parry and Iyer's study¹¹ it was shown that out of 50 cases of supernumerary teeth found in the maxilla, 33 were with mid-line, 11 on the right side and 6 on the left side.

Jaw difference:-

The maxilla has been found to be involved more often than the mandible. Ratios reported include: 4:1,⁴⁶ 5:1,^{2,47} 8:1,¹ 8.2:1⁴⁸⁻⁵⁰ and 9:1.⁵¹ Primosch³⁵ found 90 percent of supernumerary teeth were in the maxilla. Out of 51 cases with

supernumerary teeth recorded by Parry and Iyer¹¹ in 2,000 orthodontic patients, only one case was found in the mandible.

Regional differences:-

Supernumerary teeth can be classified topographically into three types as follows:

- Mesiodens occurring in the midline region of the premaxilla. These are typically of conical shape and may be found singly or multiply, unilaterally or bilaterally, erupted or impacted and vertical, horizontal or inverted.
- Supernumerary premolars
- Paramolars or distomolars (fourth molars). These are found in the molar region. Paramolars are rudimentary teeth, usually small in size and located buccally or lingually to one of the maxillary molars, or more often in the interproximal space of the second and third molars buccally. Distomolars are usually rudimentary teeth of small size, situated distal to the third molars and these supernumerary teeth rarely delay or impede the eruption of the adjacent teeth.

Different sites within the dental arches have been found to have different relative frequencies of supernumeraries. These are tabulated below.

The upper incisor region has been reported as the region most frequently affected by supernumerary teeth,^{1, 9, 19-21, 23, 31, 36, 52} with the maxillary midline supernumeraries the most common type, followed by the maxillary fourth molars.^{1, 17, 21, 32, 36, 51, 53} Other supernumerary teeth such as maxillary paramolars, mandibular premolars, maxillary lateral incisors and mandibular fourth molars are seen. Mandibular central incisors and maxillary premolars are occasionally found. Poytonet al.⁵⁴ stated that the most common order of frequency of the occurrence of supernumerary teeth is central incisors, followed by molars, premolars, cuspids and lateral incisors.

Time of appearance:-

Supernumerary teeth can be classified chronologically⁴⁰ as:

- Predeciduous. This is widely referred to those structures that sometimes could be seen in the gum pads, particularly in the mandibular incisor region, of the newborn child or within the first 30 days of life. Thus they are “inappropriately” called natal and neonatal teeth, although, sometimes they are both called “natal teeth” which is more appropriate. They appear as “horney” structures which are usually shed after the first few weeks of life. Although some authors have pointed out that these teeth may be considered as predeciduous supernumerary teeth, most of these teeth represent prematurely erupted teeth of the deciduous dentition.
- Similar to the permanent teeth. That is, these teeth erupt at the same time of the permanent teeth eruption.
- Post permanent. These teeth erupt noticeably after the permanent teeth have erupted.⁵⁵⁻⁵⁷
- Complementary. These supernumerary teeth develop long after the whole permanent dentition have completely erupted.

Extent of eruption and position of supernumerary teeth:-

Supernumerary teeth can erupt or remain impacted in the jaw. The ratio of impacted to erupted supernumerary teeth has been found to range from 3 to 1^{1, 14, 20, 58} to 5 to 1.⁵⁹ Generally, supernumerary teeth in the primary dentition erupt more often than those in the permanent dentition (73% versus 25%).^{1, 17, 29, 37, 38, 53, 54} Parry and Iyer¹¹ found eruption was confirmed in 35 cases out of 50 cases of supernumerary teeth in 2,000 orthodontic patients. Impaction was seen in 11 cases and 4 cases could not be verified due to a lack of suitable material. This finding does not correspond with the majority of results reported by different authors. The contradiction may logically be explained by the bias in selecting the material for the study. It may have a special interest for comparable studies in orthodontic patient populations only. Unerupted supernumerary teeth are often asymptomatic, discovered as incidental radiographical findings. Hence a complete radiographic screening of the whole oral cavity, particularly in the permanent dentition, is necessary to detect the presence of all impacted supernumerary teeth.⁵⁴

Supernumerary teeth were most commonly found located in a lingual position relative to the dental arch.^{36, 60} Nazif and his associates³⁶ found that tuberculate, as well as inverted supernumerary teeth were more likely to remain impacted in the jaw. In their sample of 50 patients with impacted supernumerary teeth 20 percent were in an inverted position. Parry and Iyer¹¹ found that out of 50 cases with supernumeraries in the maxilla, 41 were properly aligned with the crowns and 9 were inverted.

Severity:-

In some studies supernumerary teeth have been found to occur singly in 76-86 percent of all cases, in pairs in 12-23 percent and only less than 1 percent of supernumerary cases have been found to have three or more extra teeth.^{11, 12, 14, 15} Stafne,¹ in his most comprehensive survey, found that only 12 percent of supernumerary teeth patients found had two supernumeraries and 1 percent had three. Grahnen and Lindahl⁴⁷ found in their prevalence study that the supernumerary teeth never exceeded 2 in one individual and only one region was involved in supernumerary teeth in most of the individuals. Others reported that multiple supernumerary teeth occur in approximately 14 percent of the subjects.^{17, 35, 36} Thus multiple supernumerary teeth are found to be rare especially of cases with more than 2 supernumeraries although cases of multiple supernumeraries have been reported.⁶¹⁻⁶⁷ Foley and del Rio⁶⁸ have reported an interesting case of 14 supernumerary teeth with the possibility of a heredity aetiology. So⁶⁹ also reported an unusual case of 14 supernumerary teeth, seven in the maxilla and seven in the mandible, six were symmetrically situated in each jaw in the canine and premolar regions of all quadrants, one between the maxillary right lateral incisor and canine and one between the mandibular right second premolar and first molar.

Table 1:- Prevalence of supernumerary teeth in the permanent dentition (sexes combined).

| Author | Country | Sample size | Subjects (Age/years) | Prevalence % | |
|---------------------------------|----------------------|-------------|---|--------------|----------|
| | | | | Erupted | Total |
| Stafne (1932) | USA | 48,550 | adults dental hospital patients | | 0.91 |
| MacPhee (1935) | UK (Glasgow) | 4,000 | schoolchildren | 0.3 | |
| Dolder (1937) | Switzerland (Bern) | 10,000 | Schoolchildren (6-15) | 0.3 | |
| Werther & Rothenberg (1939) | USA | 1,000 | Schoolchildren (3-15) | | 1.6 |
| Tinn (1940) | UK (Yorkshire) | 8,500 | Schoolchildren | 0.3 | |
| Byrd (1943) | Gggenheim | 2,835 | Dental clinic patients (4-14) | | 0.5 |
| Clayton (1956) | USA | 3,557 | (3-12) | | 1.9 |
| Gardiner (1956) | UK (Sheffield) | 1,000 | Schoolchildren | 0.3 | |
| Lind (1959) | Sweden | 1,717 | Schoolchildren | | 3.6 |
| Gardiner (1961) | UK (Sheffield) | 2,250 | Dental hospital patients | | 4.5 |
| Parry & Iyer (1961) | India | 2,000 | Orthodontic patients | 1.7 | 2.5 |
| Grahnen & Lindahl (1961) | Sweden (Malmo) | 1,052 | adults dental students | | 1.7-3.1* |
| Lacoste <i>et al.</i> (1962) | France | 3,000 | children | | 2.8 |
| Niswander & Sujaku (1963) | Japan | 4,150 | (5-12) | | 3.4 |
| Rosenzweig & Garbaski (1965) | Jerusalem | 28,000 | schoolchildren | 0.1 | |
| Luten (1967) | | 1,558 | Private pedodontic practice | | 2 |
| McKibben & Brearley (1971) | | 1,500 | White children (3-12) | | 1.5 |
| Egermark-Eriksson & Lind (1971) | Sweden | 3,608 | Schoolchildren (10-16) | | 1.44 |
| Thilander & Myrberg (1973) | Sweden (Umea) | 5,459 | Schoolchildren (13) | | 1.1 |
| Brook (1974) | UK (Buckinghamshire) | 1,115 | Schoolchildren (11-14) | | 2.1 |
| Bergstrom (1977) | Sweden | 2,589 | Schoolchildren (8-9) | | 1.5 |
| Bodin <i>et al.</i> (1978) | Sweden | 21,609 | Patients attending Dept of Oral Surgery | | 1.6 |
| Buenviaje & Rapp (1984) | USA | 2,439 | (2-12) | | 0.45 |
| Davis (1987) | China (Hong Kong) | 1,093 | Schoolchildren (12) | | 2.7 |

* 3.1 if the information obtained from the case histories was accepted and 1.7 if was not.

Conclusions:-

1. Supernumerary teeth are not uncommon dental anomaly with a prevalence range of 0.15 to 3.8 percent.
2. They can occur almost anywhere in the mouth and may exist unilaterally or bilaterally, but the upper incisor region has been reported as the region most frequently affected by supernumerary teeth.
3. In Caucasian children males were found to be affected approximately twice as often as females in the permanent dentition.
4. Supernumerary teeth can be classified morphologically and topographically.
5. They present with different severities, but multiple supernumerary teeth are found to be rare especially of cases with more than 2 supernumeraries.

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