Genetics

Is the study of heredity or the study of how traits are passed from parents to offspring. This study is largely based on genes. Genes are structure found in every single cell that contain information about traits that an organism has or carries.

Gene

Is the basic physical and functional unit of heredity. Genes, which are made up of DNA, act as instructions to make molecules called protein. In human, genes vary in size from a few hundred DNA bases to more than 2 million bases. The Human Genome Project has estimated that human have between 20,000 and 25,000 genes.

Mutation

The changing of the structure of a gene, resulting in a variant form which may be transmitted to subsequent generation, caused by the alteration of single base units in DNA, or the deletion, insertion, or rearrangement of larger sections of genes or chromosomes.

Gene mutation can be classified in two major ways:

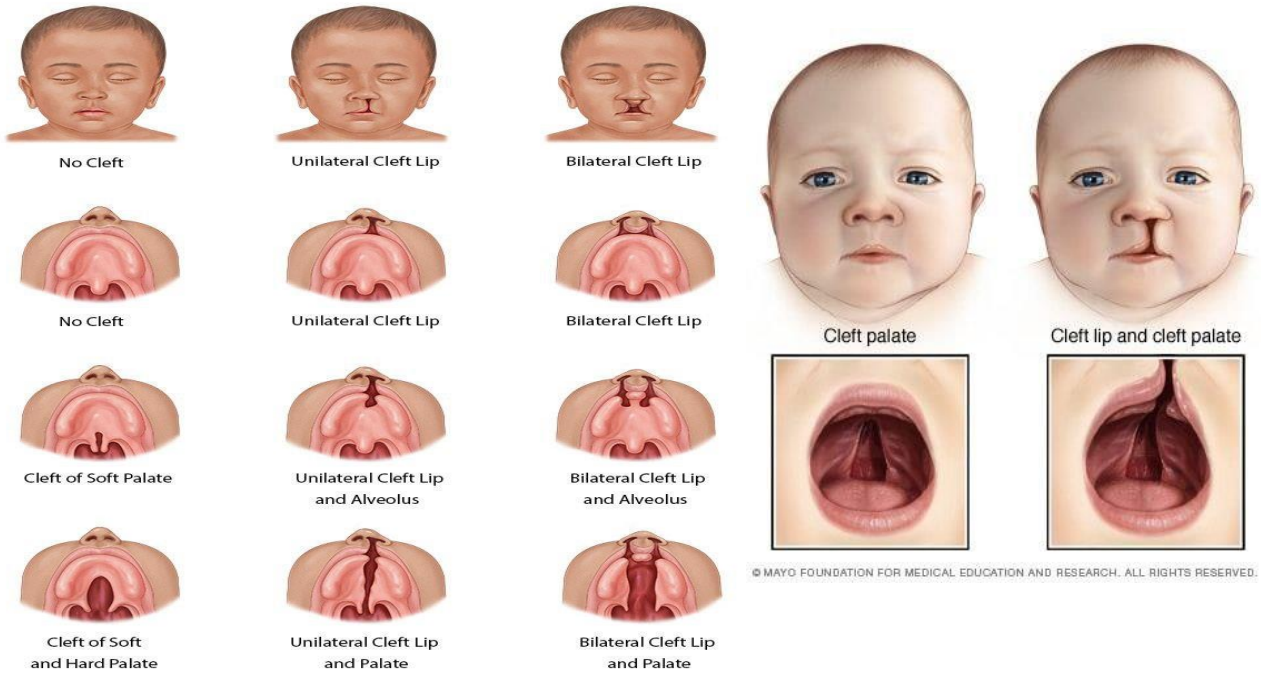
- Hereditary mutation are inherited from a parent and are present throughout a person‟ s life in virtually every cell in the body. These mutations are also called germline mutations because they are present in the parent‟ s egg or sperm cells, which are also called germ cells. When an egg and a sperm cell unite, the resulting fertilized egg cell receives DNA from both parents. If this DNA has a mutation, the child that grows from the fertilized egg will have the mutation in each of his or her cells.

- Acquired (or somatic) mutations occur at some time during a person‟ s life and are present only in certain cells, not in every cell in the body. These changes can be caused by environmental factors such as ultraviolet radiation from the sun, or can occur if an error is made as DNA copies itself during cell division. Acquired mutations in somatic cells (cells other than sperm and egg cells) cannot be passed to the next generation

Genetic Dental Abnormalities: Types and Symptoms

Genetic mouth/dental abnormalities (anomalies) are problems, dysfunctions and diseases of oral tissue and dentition caused by defective genes. Many genetic dental/oral abnormalities indicate more complex disorders and are linked to inherited traits and defects, or result from spontaneous genetic mutations.

Cleft Lip & Cleft Palate: The most common craniofacial deformity is cleft of the lip and palate. Cleft, the incomplete fusion of the lip and/or palate, can appear alone or as part of a hereditary syndrome. Family history of cleft increases the chances of inheriting the disorder. Cleft lip with or without a cleft palate occurs most frequently among Asians. Seen more often in boys than girls, cleft lip or “harelip” usually appears on one side, most often on the left. A bilateral or two-sided cleft is less common. An incomplete cleft stops short of the nostril; a complete cleft goes into the nostril. Both cleft types often involve the palate. A typical patient with cleft palate/cleft ridge has defects in the roof of the palate, with an opening into the nasal cavity.



Malocclusion

Also called a bad bite, malocclusion is caused by crowded, extra or missing teeth, or jaws out of alignment. Most malocclusions are inherited genetically and can lead to temporomandibular jaw (TMJ) disorders that can result in problems chewing and speaking. The objective of the diagnosis, and surgical and non-surgical management of malocclusions and potential TMJ complications, is to restore normal function and eliminate pain.

Oral Cancer

Often starting as a tiny, inconsequential white or red spot or sore anywhere in the mouth, most oral cancer often occur in people who use tobacco and alcohol and are most likely to strike after age 40. However, genetic factors also play a role. These include hereditary predisposition, oncogenes (genes that change growth patterns) and mutations in tumor suppressor genes. Someone with a hereditary predisposition for cancer has a greater chance of developing cancer due to inherited genes, which make body cells more sensitive to cancer-contributing factors such as tobacco, alcohol and sunlight. Mutation in an oncogene may convert ordinary body cells into cancer cells. Mutations of normal tumor suppressor genes – which are anti- cancer genes that slow down or stop the growth of normal body cells – also can give rise to oral cancer.

Canker Sores

Canker sores are small ulcers with a white or gray base and a red border that appear inside the mouth. Non-contagious, canker sores can recur frequently. Immune system problems, bacterial infections or hereditary predisposition may be possible causes.

Treatment

If you suspect that your dental/oral problems are caused by a genetic abnormality, visit your dentist as soon as possible to discuss your symptoms and undergo an examination. Your dentist will likely review your complete medical history and perform a thorough oral examination in order to help identify the cause of your dental/mouth problems and provide appropriate treatment and referral.