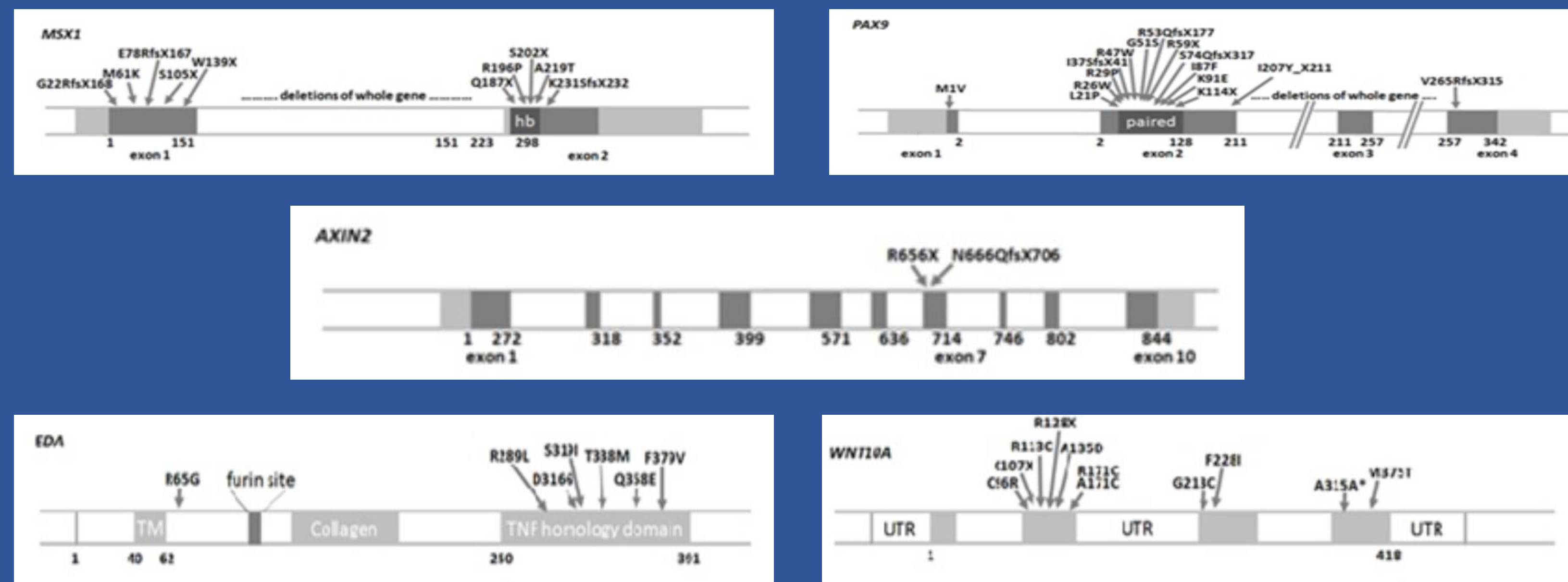




Introduction

The prevalence of tooth agenesis has been reported to be between 3% and 10% with a higher prevalence in women than men⁶. The most common congenitally missing teeth (excluding third molars) are the mandibular second premolars followed by the maxillary lateral incisors and maxillary second premolars⁸. Multiple publications have attempted to find an association between cancer development and tooth agenesis. This narrative review was conducted to further investigate a potential association between tooth agenesis and the risk of developing cancer, with a focus on the type of cancer, and age of onset.



Background

Research has explored the link between tooth agenesis and cancer. Kuchler and colleagues found that individuals with tooth agenesis presented an increased likelihood of a family history of cancer, with an odds ratio of 2.7. Key gene mutations associated with tooth agenesis and cancer development include AXIN2, MSX1, and PAX9. These crucial genes are involved in regulating embryonic development and cellular maintenance which can lead to tooth agenesis. The same genetic mutation, however, may result in the development of cancer, triggered by epigenetic factors, which would likely not be detected until later. Thus, tooth agenesis has the potential to serve as an early risk marker for future cancer development.

Methods

A narrative review was conducted by compiling information from ten scientific peer-reviewed publications to help better understand the scientific question, "What is the association between tooth agenesis and developing age-specific cancers?". The results and conclusions from these studies were evaluated to ascertain the strength of association among tooth agenesis, age, and cancer types. **The most recent publication in JAMA by Eiset was a population-based cohort study of 2.5 million people with 40 years of follow-up.**

Results

Preliminary findings suggest that there may be an association between tooth agenesis and risk of cancer development. The studies reviewed also indicated that the type of cancer developed may be age-specific. However, it is important to note that the current scientific evidence is limited and does not provide conclusive results.

Conclusions

The link between tooth agenesis and cancer is of interest and could have clinical relevance by incorporating risk assessment of patients presenting with tooth agenesis. Prosthodontists and medical colleagues must be aware of this association and encourage patients and their parents/guardians to seek medical advice. **Since prosthodontists treat their patients longitudinally, this specialty could play a major role in early screening and promoting education and awareness of potential health concerns.** It is important to note that there are many limitations to the Eiset study. The study is a population-based cohort study therefore there is no proof of causation. The timing of tooth eruption can also affect the results, as tooth agenesis is a congenital condition, but does not present at birth. Genetic evaluation of the associations could clarify the possible clinical implications, in particular, the rationale for genetic testing of individuals with tooth agenesis, cancer surveillance, and the possibility of future targeted cancer treatments. With more robust research support for this association, clinical protocols, and specific training, prosthodontists will prove useful in identifying the risk of cancer development in patients with tooth agenesis.

