“Essentially, we are not adapted to the diets we eat today”

An interview with Prof. Debbie Guatelli-Steinberg, US

By Kristin Hübner, DTI

In her book *What Teeth Reveal About Human Evolution* (Cambridge University Press, 2016), anthropologist Prof. Debbie Guatelli-Steinberg describes what fossilised teeth reveal about history and the living conditions of our ancestors. One finding is that the high proportion of soft and sugary food people consume in the Western world these days is to blame for the steady rise of dental problems such as dental decay and malocclusion. Dental Tribune had the opportunity to speak to the Ohio State University professor about the causes of this development and the impact her research may have on modern life.

**Dental Tribune: Prof. Guatelli-Steinberg, you are studying fossilised teeth in order to shed light on the living conditions of our ancestors. What can teeth reveal about earlier life and human evolution?**

**Prof. Debbie Guatelli-Steinberg:** Teeth make up most of the mammalian fossil record, and this is true for human evolution as well. The reason: teeth are heavily mineralised, so they resist destruction and decomposition. The fact that teeth are likely to fossilise is extremely convenient for physical anthropologists because teeth lock detailed information about diet and dental development in place. This information is relevant to the development of the organism as a whole, it has been possible to use the pace of dental growth and development to gauge the evolutionary transition of hominids including humans among other primates.

It is even possible, and much of my own research is about this, to use growth lines in teeth to assess the timing and duration of dental growth disruptions, providing insight into periods of physiological stress (malnutrition, illness) in the individual lives of our ancestors.

**Dental Tribune:** In your new book, you say that our teeth were adapted for a very different diet than the one we eat in Western societies today. Could you explain the negative consequences of this change in diet?

**Prof. Debbie Guatelli-Steinberg**: Yes. Over most of our evolutionary history until the rise of agriculture around 10,000 years ago, we humans were foragers, eating food that could be gathered or hunted. Those kinds of foods are the foods that our teeth are adapted to eat. With the rise of agriculture, and particularly with the more recent introduction of processed and sugary foods into the diet, there was a tremendous increase in dental malocclusion and pathology. Essentially, we are not adapted to the diets we eat today, as these dietary changes are quite recent in our evolutionary history.

**Dental Tribune:** Could you provide an example of a culture that has not been affected by processed foods and sugar? What kind of diet do they have?

**Prof. Debbie Guatelli-Steinberg**: Certainly. Native Eskimos had very little induced to processed foods and sugary sodas, and then their rates of caries increased dramatically. I have read that breastfeeding provides optimal oral mechanical stimulation for the jaw’s normal development. Given the decrease in breastfeeding, could that mean modern children are at a higher risk of developing malocclusion and requiring orthodontic treatment?

**Dental Tribune:** That is a great question, but as I am not a dental practitioner, I do not have a great answer! I can tell you that Prof. Corruccini’s pioneering experimental studies on baboons (which rarely show malocclusion) showed that soft diets led to dental crowding and rotations of teeth. Essentially, without foods that were hard or tough, bone growth in the jaw bones was not great enough to accommodate the animal’s teeth.

**Dental Tribune:** What role does genetics play in influencing teeth, oral health and jaw development? Since evolution is a process of many millions of years, it is probably not possible to turn back the wheel of time just by sticking to a certain diet.

**Prof. Debbie Guatelli-Steinberg**: Yes, over most of our evolutionary history until the rise of agriculture around 10,000 years ago, we humans were foragers, eating food that could be gathered or hunted. Those kinds of foods are the foods that our teeth are adapted to eat. With the rise of agriculture, and particularly with the more recent introduction of processed and sugary foods into the diet, there was an enormous increase in dental malocclusion and pathology. Essentially, we are not adapted to the diets we eat today, as these dietary changes are quite recent in our evolutionary history.

**Dental Tribune:** Thank you very much for the interview.

**Prof. Debbie Guatelli-Steinberg**: You’re welcome. It was a pleasure.