

Ancient Mutation Explains Missing Wisdom Teeth

By Douglas Main | March 13, 2013 (livescience.com)

BOSTON — Many people have suffered from impacted third molars, also known as wisdom teeth. But there are also a lucky few who are missing a wisdom tooth or two (or even all four). Why do some people have wisdom teeth, while others don't?

The answer, partly hinted at in new research presented here at the annual meeting of the American Association for the Advancement of Science, could also explain why particular ethnic groups, such as the Inuit, have a particularly low occurrence of wisdom teeth.

Some thousands of years ago, a random mutation arose which suppressed the formation of wisdom teeth, a trait that then spread and now accounts for the lack of wisdom teeth among some modern humans, said Princeton University researcher Alan Mann.

The oldest fossils missing third molars hail from China and are about 300,000 to 400,000 years old, suggesting the first mutation may have arisen there, Mann told LiveScience.

Like most mammals, humans' ancestors had four sets of three molars (for a total of 12, with six in both the upper and lower jaw) used to help chew and grind food. Unlike other mammals, however, humans underwent a period of evolution in which the **brain greatly expanded in size**, Mann said. This created an architectural problem; with a much larger brain case, the jaw had to become narrower so that it could still connect to the lower part of the skull, Mann said.

Genes that control the quantity of teeth, however, evolve independently from those that control brain development, Mann's research has shown. This led to a mismatch, in which the human jaw was no longer large enough, in many cases, to give wisdom teeth room to erupt through the gums.

Impacted third molars (teeth that do not make it out of the gums) can become infected, leading to serious health problems. Even more commonly, however, **wisdom teeth cause severe pain**. This fact alone could help explain how the lack of wisdom teeth evolved, Mann said: The pain could make one less likely to reproduce. That would favor people with the mutation, who would suffer less pain, he added.

"Imagine a scenario where one evening a person is in serious pain from an impacted third molar," Mann said. "Their partner comes up and says, 'How about a bout of reproduction?' And the person says, 'Not tonight, dear, my jaws are killing me.'"

Perhaps 10 to 25 percent of Americans of European ancestry are missing at least one third molar, Mann said. For African Americans and Asian Americans, the figure is 11 percent and 40 percent, respectively, he said. But the Inuit, a group of people who live in the Arctic regions of Canada, Greenland and Alaska, have the fewest **wisdom teeth**; about 45 percent of them lack one or more third molar, he said.

There are probably a couple reasons for this. For one, this group originated in Asia, where the oldest fossils lacking wisdom teeth were found, Mann said. Secondly, like other Asians, the Inuit tend to have flatter faces (when compared to Europeans and Africans), meaning they have even narrower jaws, leaving less room for teeth, he said. Third, Inuit teeth also tend to be larger than average, meaning that this mutation would be even more advantageous in this population, Mann said.

Questions:

1. According to Mann, why do some people not have wisdom teeth?
2. Where did the gene mutation appear to arise and how long ago?
3. Mann hypothesizes that as the human brain and brain case evolved to become larger, the jaw became smaller. How did this affect the teeth?
4. What ethnic groups are most likely not to have wisdom teeth?
 - _____ of European Americans
 - _____ of African Americans
 - _____ of Asians Americans
 - _____ of Inuit people of Alaska, Canada, and Greenland
5. What is the purposed reason for the lack of wisdom teeth in Inuit and Asian people?
 1. The mutation started in _____.
 2. Asian's tend to have _____ with narrow jaws which can accommodate less teeth.
 3. Inuit's tend to have _____ teeth than other people.
6. What was the author's purpose for writing this article?