Can mercury from dental fillings travel through teeth?

**Dental amalgam fillings** made with mercury have been used for many years, but there are concerns about the risk to human health. A recent study suggests that mercury can travel through the tooth and enter the tooth’s active bloodstream. This is another route of exposure to mercury in addition to the release of the toxin from the surface of the filling.

It is known that biting and chewing can erode the surface of amalgam fillings, releasing mercury in the mouth that can be inhaled or ingested. Mercury affects the nervous tissue and organs, such as the kidneys, although concentrations from amalgams are not thought to be high enough to have serious health effects, except in a few susceptible people. However, accumulated mercury exposure, from sources including air pollution and food, in addition to amalgam fillings, has caused concern for some. A report on the potential health and environmental risks of dental fillings has been prepared by a scientific committee of the European Union¹.

In this particular study, the researchers used x-ray techniques to examine cross sections of teeth that had been extracted from patients. The amalgam fillings and linings around the fillings had been removed.

They detected small ‘hotspots’ of mercury of up to 10 mg g⁻¹ (milligrams of mercury per gram of tooth) and higher concentrations of zinc (greater than 100 mg g⁻¹) up to several millimeters from where the amalgam filling had been. Zinc is a major component of the lining applied to teeth before filling with amalgam. The researchers suggest that zinc and mercury had migrated from the filling and lining through to the pulp (or nerve tissue) of the tooth where mercury could be released directly into the pulp bloodstream.

The zinc appeared to be evenly distributed, whereas the mercury was concentrated in the tiny tubes that run through dentine in teeth (dentine is the central layer of a tooth, between the enamel and the pulp). The difference in the way that the mercury and zinc are distributed suggests that there are different mechanisms for their movement.

Fillings are applied under pressure, when the amalgam is soft to remove excess mercury, which then results in the amalgam hardening. The researchers suggest that mercury may have initially moved physically through the tooth at this point, especially as copper and silver were also found with the mercury hotspots; these metals are also in the dental amalgam. They suggest that zinc is likely to have moved through the tooth through a series of chemical reactions. In time, the chemical form of mercury will have changed and it is possible that it may have migrated again through chemical reactions.

Significant amounts of mercury were also detected in the calculus (the hard deposit that forms on teeth from accumulated food, bacteria and minerals from saliva). This indicates that mercury can also migrate from the surface of the fillings to the calculus. Therefore, care should be taken to avoid ingesting any calculus that has been loosened from the teeth.

This study was not able to tell how much mercury migrating through teeth would be released into the bloodstream on a daily basis. However, it appears that significant amounts could enter the body via these two different mechanisms of migration, through the tooth as well as ingestion of calculus.


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