

2 infants inhaled cancer cells from mothers during birth

It's extremely rare for cancer to transfer from mothers to babies, but not unheard of.



A baby's hand resting on a mother's hand.
(Image: © Shutterstock)

Two infants in Japan may have developed [lung cancer](#) after inhaling cancer cells from their mothers at birth, according to a new case report.

About 1 in 1,000 babies are born to mothers who have cancer, but only about one in 500,000 of these newborns develops cancer from their mother. Though these cases are extremely rare, researchers had known that the transfer can happen if cancer cells, traveling in the mother's blood, get into the placenta.

Now, researchers in Japan have identified a previously unknown route of transmission: Two infants who were born to mothers with [cervical cancer](#) may have developed lung cancer after "aspirating" tumor cells that were present in the amniotic fluid, secretions or blood from the cervix, the authors wrote in a case study published Jan. 7 in [The New England Journal of Medicine](#).

The cases involved a 23-month-old boy who went to a local hospital in Japan with a cough that didn't subside for two weeks and a 6-year-old boy who went to the hospital with chest pain. Both boys were diagnosed with lung cancer.

The mother of the 23-month-old boy was diagnosed with cervical cancer three months after the boy was born, but likely had a tumor at the time of his birth. The boy and the mother were treated with chemotherapy, different medications and surgeries to remove cancerous tissue; and while the boy's cancer disappeared, the mother's progressed and led to her death five months later.

The mother of the 6-year-old boy had a known cervical tumor during her pregnancy but one that was thought to be stable and so wasn't treated at the time, according to the report. After delivery, a biopsy revealed she had cervical cancer; she died two years after surgery to remove the tumor. The boy underwent [chemotherapy](#) among other treatments and had his left lung removed; he was followed for 15 months after his surgery and remained cancer-free, according to the report.

To understand the relationship between the tumors in the mothers and their children, the researchers compared tumor tissues and normal tissues from the two young patients and their mothers, specifically looking for mutations in 114 cancer-related genes. They found that the boys' lung tumors had many genetic similarities to the mothers' cervical tumors.

The boys' tumors both lacked the Y [chromosome](#) — one of two sex chromosomes passed down from father to son — meaning that the tumor was likely inherited from the mothers. They also discovered that the tumors had similar characteristics to the tumors found in each of the boys' mothers, such as mutations that occur in cells called somatic cells that aren't typically passed down to children. The lung tumors also contained small genetic mutations similar to those in the mother that were not found in the child's other tissues. Both boys' tumors also held DNA from the [human papillomavirus \(HPV\)](#), which is thought to cause most cases of cervical cancer.

The "detailed genomic scrutiny and comparison of the cancer cells from mother and child provide unambiguous evidence" that the two tumors are from the same clone, or group of identical cells, said Sir Mel Greaves, founding director of The Centre for Evolution and Cancer at The Institute of Cancer Research in London, who was not a part of the study. "The story is very credible."

Because these patients developed tumors specifically in the [lungs](#) and not across the body as is common in most other documented cases of mother-to-child cancer spread, the infants likely "aspirated" their tumor cells from their mothers during birth, the authors wrote. It is "rather likely though not provable" that this is what happened, Greaves told Live Science in an email. Though extremely rare, these cases indicate that it's possible to transfer cancer to infants during birth, and so the authors recommend [C-sections](#) for mothers with cervical cancer.

"This is a very interesting report," said Dr. Theodore Laetsch, a pediatric oncologist and director of the Very Rare Malignant Tumors Program at the Children's Hospital of Philadelphia, who was also not involved in the study. It is "clear from the genetic data that both infants' cancers came from the cancer in their mothers."

But "I still think it is possible the cancer crossed the placenta as has been described in other patients and that the cancer cells only grew in the lungs for other reasons," Laetsch wrote in an email to Live Science. **-Originally published on Live Science.com. January 15, 2021**