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## LEGAL MEDICINE

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# They reveal a lot: how tattoos help to clear up crimes

*The evidence is on the skin - tattoos reveal the identity of corpses and perpetrators to investigators. Knowledge about tattoos is therefore essential for legal practitioners and investigators.*

Frank Ramsthaler's job is not easy. This is not only because he has a corpse lying on the section table every day, but also because the forensic scientist does not always know who the deceased person is.

A torrent of sweetish smell wafts through the tiled hall in the Homburger Institute for Legal Medicine of the University of the Saarland. The day before, a man was found dead in his car in a wooded area, with deep cuts on his neck. It is Ramsthaler's job to find out what the man died from.

The forensic physician wears a smock, full beard and nickel spectacles. Over the edge he nods to the taxidermist. He then starts to T-cut. From shoulder to shoulder, from the neck to the pubic bone, he cuts open the corpse. Legal physicians have three tasks: they must explain what a person has died from, determine the type of death and find out who this person is, thus clearly identifying the dead. In most cases this is not a problem, for example if the deceased person died in the hospital or at home. It becomes difficult when the body is found in a forest or the decay is far advanced. If there are still failures such as DNA analysis, fingerprints and dental status, Ramsthaler has a problem. Its solution is sometimes on the skin. Ramsthaler then tries to clarify the identity of the dead through tattoos. Almost one in five adults in Germany now wears a tattoo - and the trend is rising. Although there are no official statistics, the numbers in Switzerland are likely to be similar.

## **Pictures published**

The motifs are becoming ever more extravagant and more and more people are posting pictures of their tattoos in social media. The fancier and more complex the tattoo, the higher the likelihood that someone will recognize it. That's Ramsthaler's chance.

In consultation with the responsible public prosecutor, the forensic doctor shoots a photo of the tattoo motif, passes it on to the media and involves the public in the identification. A rare but very efficient process.

Of the approximately 350 dead who land on his section table every year, only about three to four cases are identified solely on the basis of the tattoo. But the importance of tattoos is increasing. From them are decisive hints.

## **The case of the mafia boss**

From the tattoo analysis benefit not only forensics, but also investigators. Just recently, a spectacular case demonstrated how this can become a trap. For 15 years investigators searched for the Japanese mafia boss Shigeharu Shirai. Unsuccessful.

Only the photo of his tattoo brought the turn. The senior member of Yakuza was engrossed in a board game in Lopburi, Thailand, when a tattoo fan approached him and asked him to photograph his impressive full-body tattoo. Shigeharu Shirai allowed it.

A fateful decision, because the enthusiastic fan posted the photo on Facebook. It was shared a thousand times. A few days later, the handcuffs clicked in Thailand.

A similar spectacular case can be remembered by New York forensic scientist Michelle Miranda. She teaches law enforcement techniques at Farmingdale State College, New York, and works as a detective with the New York Police.

In the video interview, she describes how Los Angeles police succeeded in convicting a man who had tattooed the scene of a murder he had committed on his chest.

When the officers arrested him for another offense, an investigator recognized the illustrated liquor store on the tattoo. In front of the shop was a dead person. The tattoo reminded the investigator of a real crime scene that looked exactly the same. He was right. The man was convicted.

### **Fashion trends help with dating**

Miranda's recently published textbook "Forensic Analysis of Tattoo and Tattoo Ink" is well received by lawyers in German-speaking countries. In order to clarify why knowledge about tattooing is indispensable for forensic physicians and investigators, the scientist has studied the composition and history of tattoo inks. "Location, design, color - the great thing about tattoos is that they can provide a wealth of information at a glance," she says.

In a square centimeter of skin, tattoo artists apply about 2.5 milligrams of paint. In the process, a large part of the color sticks in the second skin layer, the remainder is transported away via the lymphatic system. Mostly there are pigment deposits in the lymph nodes.

Miranda sees this as an opportunity: At some point, you can trace a particular pigment mixture back to the manufacturer, she says, or assign a specific style to a specific tattoo parlor.

In addition, tattoo motifs are subject to certain fashions: from the notorious ass antlers of the mid-nineties to Asian characters, small filigree tattoos such as stars and moons from the early nineties to large-scale complex tattoos today. "Tattoos serve as pieces of a puzzle, sometimes even allowing conclusions about the age of the wearer," says Miranda.

Ramsthaler does not seem to impress that, he is himself tattooed several times. On his forearm there is a sketch of a da Vinci generator. An idiosyncratic motif. Should Ramsthaler commit or become a victim of a crime, he would be fairly easy to identify. "The safest murder is that of being a forensic lawyer yourself," he says, grinning.

### **Family photo as proof**

Then he sets to work. "They rather fear us as postmortem smartwigs," he says as he lets water flow into the dead man's pouch in front of him. He is still looking for the cause of death. As bubbles bubble up, his diagnosis is clear.

Air embolism with subsequent right heart failure. A quick death. The farewell letter, the wounds, the circumstances - everything looks like suicide. The identity of the dead is also certain. After two hours the autopsy is finished. It's not always that fast.

For example, in the case of the ice angler from Hesse, whose identification challenged him and his colleagues seven years ago. Together with colleagues from Giessen and Frankfurt, Ramsthaler published the case report in the Archive for Criminology.

When an ice fisherman broke into a North Hessian lake in February 2011, the search by police divers was initially unsuccessful. Weeks later, walkers found a dead man drifting in the water, whose clothes matched those of the missing angler.

But as proof that was not enough. And identification by relatives was out of the question because of the body's advanced rotteness. So the lawyers had to get creative.

At the autopsy they noticed a tattoo on the dead man's left forearm. Fortunately, the police had a two-year-old family photograph of the missing person who had a tattoo on the same spot.

Ramsthaler and his colleagues tried on a not quite commonplace method. They tried to photograph the tattoo of the dead from the same point of view as on the family picture.

Then they pushed the postmortem photo with an image editing program over the family photo, until both coincided exactly. There was no doubt. The dead man was the missing angler.

Even everyday tattoos from the template catalog therefore have a recognition value if they are attached to a prominent place. And several tattoos on a body form a highly individual overall pattern.

In order to avoid blanket interpretations of motifs, however, forensic physicians like Frank Ramsthaler encourage a more intensive examination of body modifications. Some are already in contact with individual tattoo artists and associations.

Some have already stated their willingness to assist in identifying unknown deceased persons and to more closely inspect the tattoos.

The identification of tattoos should therefore always be easier. Ramsthaler has done his job for today. The section mate sprays the metal table with water. The Chief Inspector receives the preliminary autopsy report. He has been following the complete morgue. Only when opening the head he was just outside.

When the forensic doctors swap the blue smocks for street clothes, the tattoo of a colleague from Ramsthaler flashes up. The motive: a man who threatens with the index finger. The template was the box on the Monopoly board: Go to jail.

