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Case Report: Questionable Recollections of a Shooting Incident in a Victim with Frontal Lobe Injury

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Abstract We describe a man with frontal lobe injury due to a gunshot wound. He initially reported complete amnesia for the shooting incident that led to his injury. After having spoken to his friends two months post-injury, he recovered memories of the shooting incident. These recollections were probably the result of source-monitoring errors. This case shows that eyewitness memories of victims with brain damage should be treated with caution.

Keywords: Forensic science, Frontal lobe injury, Brain damage, Source monitoring errors, Eyewitness memory, Pseudo-memories.

1 Introduction

Human memory is far from perfect: People tend to forget much of what they have experienced, and events they do remember may be distorted^[1]. In some cases, people even remember entire events that never took place^[2]. Such pseudo-memories can be elicited by providing people with misinformation. In one study, (healthy) participants were asked whether they had seen live footage of a plane crash in Amsterdam^[3]. Although no such footage exist, many participants were sensitive to the misinformation implicitly implied by the question and said they had seen the crash on television. The authors argued that their participants had created pseudo-memories because of source-monitoring errors. That is, the participants mistook self-generated images of the plane crash for their own memories.

When retrieving information from memory, the frontal lobes are responsible for evaluating the source of the recollected information ("Did I really experienced this event, or was it suggested to me by others?")^[4]. Because people with frontal lobe injury often make source-monitoring errors, they are prone to create pseudo-memories^[5].

Distorted memories in people with brain damage may have forensic consequences. In people with damage

to the frontal lobe as a result of a crime, suggested information about criminal events provided by others may easily be taken for truly experienced memories. In this article, we describe a man with frontal lobe injury due to a gunshot wound who probably developed non-authentic memories of a shooting incident by talking to other witnesses.

2 Case

Two men had an argument in a bar. This nearly led to a bar fight, but a doorman was able to diffuse the conflict between them. After the incident, the two continued to quarrel through social media networks. About four weeks after their argument in the bar, they decided to settle their dispute with a fistfight somewhere in the woods. Both men brought along some friends to the place of the fight. During the fistfight, two other men (one belonging to one group of friends, the other to the other group) began to quarrel. One of these two quarrelling men grabbed a gun and shot the other through his head. An ambulance was called and the victim was taken to hospital. A few hours later, he underwent emergency surgery to remove the bullet from his brain. This projectile and the surgical procedure to remove it resulted in substantial damage to his frontal lobes. MRI scans showed that both his left and right frontal lobe were affected.

The victim was comatose for more than a week. After six weeks in hospital, he was admitted to a clinic specialized in cognitive rehabilitation. He was discharged from this clinic six weeks later.

About three and a half weeks after the shooting incident, while still hospitalized, the victim was interviewed by the police. He told the police that he did not know what had happened to him. The man was again interviewed 12, 14 and 15 weeks after the incident. During these three interviews, he informed the police that he had recovered his memories of the incident. Especially during the last two interviews, he was able to provide the police with a very detailed description of the shooting incident. He could even tell what went on in his mind as he lied wounded on the ground. During the last interview, the man said that he initially could not remember anything from the shooting incident. At first, he thought that he had been shot by the brother of his former girlfriend (this man had not been around during the shooting incident). About two months after the shooting incident, while in the rehabilitation clinic, the man was visited by friends who had witnessed the incident. They told him about the fistfight and that he had been shot by one of witnesses of that fight. According to the victim, his memories of the shooting incident returned to him

in the hours after his friends had told him what had happened.

The description of the shooting incident given by the victim differed substantially from accounts provided by other witnesses. The victim told the police that, the moment he was shot, the shooter stood about 10 meters away from him. According to all other witnesses, the victim was shot at close range. While the victim said the shooter had pulled his own gun, the other witnesses stated that the shooter had fired at the victim after grabbing a gun from one of his friends. Because of the discrepancies between the victim's accounts and the statements made by other witnesses, we were asked by the investigative judge to determine the authenticity of the victim's eyewitness memories, particularly those that were obtained in the later police interviews. We analyzed medical case files, the interviews with the victim, and the statements of other witnesses.

We informed the court that his recollections of the shooting incident were problematic for three reasons. First, his description of the shooting incident differed substantially from the accounts provided by other witnesses. Second, when he was transferred to the rehabilitation clinic six weeks after the shooting incident, the hospital doctors informed their colleagues from the rehabilitation clinic that the victim had no recollections whatsoever of the shooting incident. Thus, the brain damage he sustained resulted in complete amnesia for the incident. Third, by taking the accounts of his friends for his own memories, it is likely that the victim managed to fill the gap in his memory. This fits well with the notion of source-monitoring errors in people with frontal lobe injury (5). It should be noted here that some people with amnesia due to traumatic brain injury gradually and spontaneously regain parts of their memory for pre-injury events over time. This phenomenon is known as 'Ribot's law' [6]. However, the victim did not recover his memories for the shooting accident spontaneously. They returned to him

after he had spoken to his friends. His recollections did not return gradually, but came to mind in the hours after he had been briefed by his friends. Also, there is evidence that Ribot's law does not apply to frontal lobe injury, but is restricted to damage to the medial temporal lobe [7]. Furthermore, and critically, although some memories for pre-injury events may return in people with frontal lobe injury, it is unlikely that experiences that took place in the moments before the shooting can be recovered. This restriction has to do with the consolidation of information from short-term to long-term memory, which takes a few minutes. If the consolidation process is interrupted by brain damage, experiences that took place in the minutes before the injury will not be stored in long-term memory. And of course, information that has not been stored in memory, can never be retrieved [7].

The judges decided that the victim's statements could not be used as evidence in court. Because of a bulk of other evidence against him, the man standing trial for the shooting was given a long prison sentence.

3 Discussion

Brain injury as a result of violence is not rare [8]. This means that victims in criminal cases occasionally suffer from brain damage. When asked to evaluate eyewitness testimonies of victims with frontal lobe damage, expert witnesses should be aware that—even if these victims were properly interviewed by the police—recollections of such people may not be authentic. In order to determine the authenticity of their memories, it seems necessary to find out if recollections of victims with frontal lobe injury might have been contaminated by external information. Note that, besides victims, defendants also may suffer from brain damage. We described a man with massive brain injury due to two cerebrovascular accidents [9]. Parts of his frontal lobes were also damaged. This man was accused of killing a friend several

years before sustaining brain damage. After many hours of interrogations, he confessed the killing to the police. We studied the defendant's criminal file, looked at videos of his interrogations, and administered a neuropsychological test battery to him. On most of our cognitive ability tests he scored very poorly. On a test developed to measure confabulation, the defendant produced a substantial number of pseudo-memories. Inspection of the videotapes revealed that the man had been interviewed in a highly suggestive way. In our expert witness report, we wrote that the defendant's confession was, in all likelihood, based on pseudo-memories. Because of source-monitoring problems, he probably mistook information presented to him by the police for his own memories. The court decided that, due to severe cognitive impairments, the man was not competent to stand trial. The case reported in our previous publication and the one reported in the present article show that, in people with brain damage, memories of criminal events should be treated with caution.

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