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CASE REPORT : STUDY OF GSR PRESENCE IN CAR INVOLVED SHOOTINGS

Thierry DODIER, Microtraces Analysis Unit, Forensic Science
Laboratory of the French Gendarmerie, Pontoise, FRANCE



Facts

Two people in a car, parked in a parking lot, were targeted by five shots from a moving car. The young man, who was sitting on the driver's side, died after being shot in the head. The first results in the investigation leads the police to a suspect near the crime scene.

The next morning, stubs have been used for sampling the suspect's hands, jacket, towel and the inside his car. the samples were analyzed by Scanning Electron Microscopy (SEM) with Energy Dispersive X-Ray Spectrometry (EDX). The results has shown a positive presence of GSR and are presented in Table 1.



SEM FEI QUANTA 400
EDX EDAX

Table 1 : Results of GSR presence on the samples

Suspect	Sampled area	Number of characteristic of GSR particles
Hands	Right, back side	1
	Right, palm side	1
	Left, back side	2
	Left, palm side	2
Clothing	Jacket	3
Object	Towel	2
Car	Gear lever	More than 100
	Steering wheel	More than 100
	Driver's door	2

To explain the presence of these GSR particles in his car, three hypotheses are proposed by the defense :

1

3 weeks before the facts, the suspect has driven to some place his father-in-law, who is a hunter.

BUT

His father-in-law wasn't at the driver seat

2

3 weeks before, the suspect has acquired and changed some parts of his car.

BUT

The steering wheel haven't been changed

3

The suspect was in the car of his father-in-law.

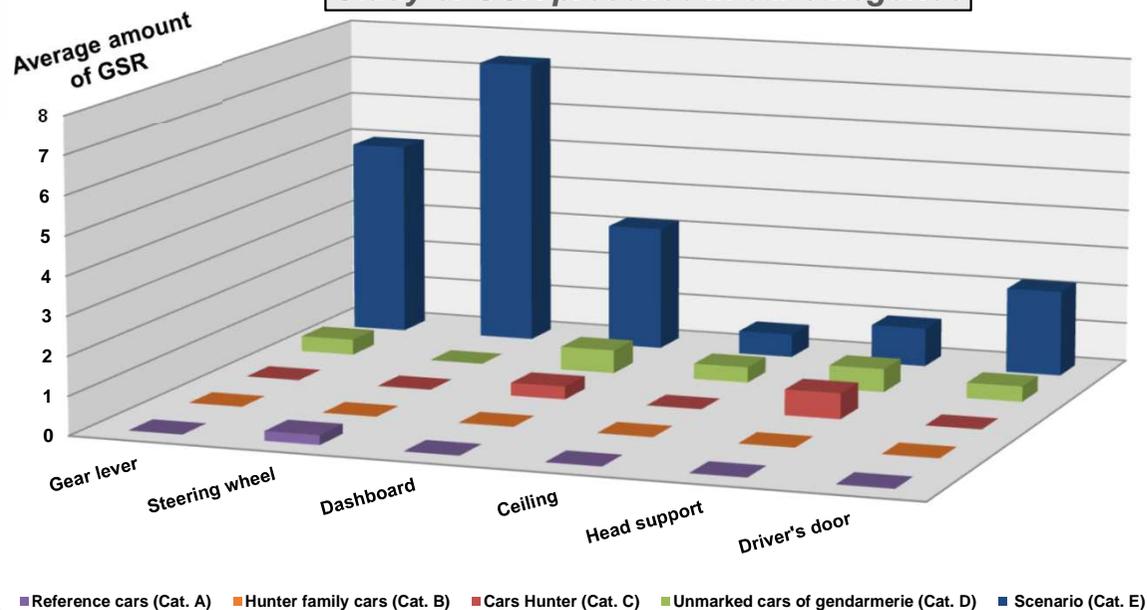
BUT

The suspect wasn't at the driver seat

To assess the indicative value of the GSR found in the suspect's car, a comparative study on different categories of cars and a simulated scenario were conducted :

- Category A : reference cars, no connection with hunting activities (4 cars)
- Category B : hunter family cars, not used for hunting (3 cars)
- Category C : hunter cars, used for hunting and other activities. The samples are made after the hunting season (3 cars)
- Category D : unmarked cars of gendarmerie, used by gendarmes for their mission (armed or not) (5 cars)
- Category E : unmarked cars of gendarmerie, used to simulate a scenario corresponding to the facts and to the firing conditions (5 cars)

Study of GSR presence in car categories



Results and discussion :

- A pollution in GSR is possible in the categories of vehicles (A, B, C and D) but will never exceed more than one particle by area sampled.
- An average amount of GSR is greater in the category E (simulated scenario) compared to the other categories.
- The presence of GSR is greater at the driver's station for category E (simulated scenario) compared to the other categories (A, B, C and D).

Confrontation of the study results with the case report :

Therefore, the analytical results, both qualitatively and quantitatively, strongly support the hypothesis that the vehicle would be involved in a firearms scene in comparison to the defense hypotheses.

