

Identification of blood group substances of fingerprints on the murder weapon by means of the adhesive strip method

Eva Simeoni and O. Grüner*

Department of Forensic Medicine, Christian Albrechts University,
Arnold-Heller-Str. 12, D-2300 Kiel, West Germany

Earlier investigations by ISHIYAMA, PROKOP and GÖHLER as well as KEIL and PAPSDORF (1977) have shown that it is possible to demonstrate blood group substances on fingerprints. We reported elsewhere (SIMEONI, GRÜNER and BURKHARDT 1984) on the application of the absorption elution method in the determination of the main blood group from fingerprints in excretors and nonexcretors of blood group substances.

The papillary line pattern of the perpetrator is not to be discerned on the tools with which crimes have been committed when it has been smudged, e.g. owing to substantial force. Nevertheless, a number of shed epithelial cells sufficient to allow such a determination to be carried out may be present.

MATERIALS AND METHODS

We took adhesive strip impressions from weapons which have been used in homicides using Tesafilm from Beiersdorf (Nr. 5529). In securing of evidence, it is absolutely necessary that the object concerned is grasped with disposable gloves so that no foreign cells can be transferred to it. The following weapons were investigated: knife handles, pistol grip, sledgehammer, neck of a bottle, belt, stick, telephone cable.

The following specific procedure was applied:

METHOD

Degreasing of the slide with alcohol.

Foil is stuck on to the slide evenly and free of air bubbles with the adhesive side on top using Uhu "second" glue without touching the adhesive side of the film (take care: blood group properties of the investigator).

Overlayer with two drops of antiserum

Incubation with antiserum for one hour at room temperature and
for two hours at refrigerator temperature
storage in a moist chamber.

Elution of the excess antiserum or lectin with 0.9% cold NaCl solution by flushing (seven times) and allowing to stand (2 x 15

*with technical assistance from H. Albin

minutes) in the staining trough (with 0.9% cold NaCl solution).

After pouring off the NaCl solution carefully, allow the surface to dry and cover with a coverglass. Allow 0.5% erythrocyte suspension to run under the coverglass.

Elution at 56°C for 15 minutes, and microscopic reading after cooling.

As can be seen from the Figures illustrating the various reactions, there is pronounced agglutination of the test erythrocytes. Reading of the tests is facilitated when the cover glass is pressed slightly with a dissecting needle in microscopy. When agglutinates are present, these can then be discerned even better owing to their movement ("in swimming past") under the microscope.

Most investigation results which we obtained were retrospectively confirmed by admission of guilt on the part of the perpetrator. Cases 8 and 10 (cf. Table) involve the same perpetrator, who was caught in a further murder. A differentiation could not be carried out in only a few cases in which the murderer and victim had the same main blood group.

To summarize, the technique presented here and the results obtained can provide indications with regard to the blood group of the murderer.

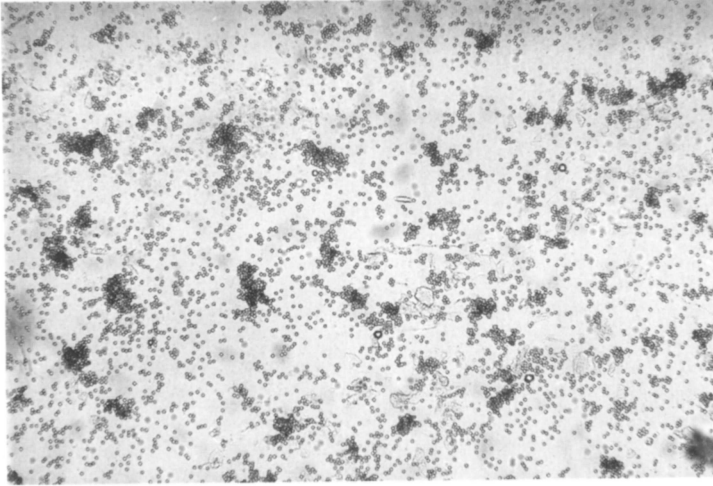
LITERATURE REFERENCES

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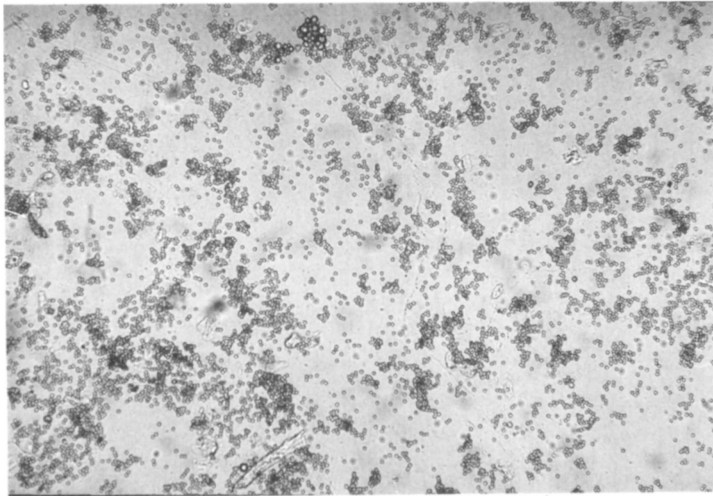
Author's address

Dr. med. E. Simeoni
Abteilung Rechtsmedizin
Arnold-Heller-Str. 12
D-2300 Kiel, West Germany

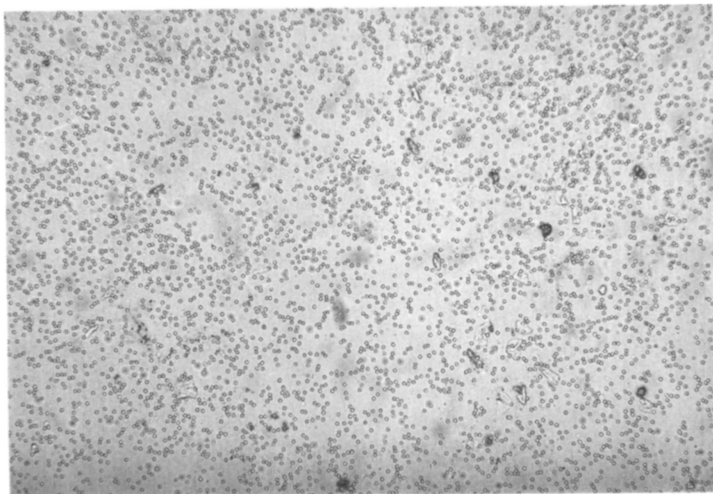
Blood group of victim	Blood group of suspect or perpetrator	Weapon	Result	Admission of guilt
A ₁	A ₁ B	knife	A, B	yes
A ₁	A ₁ B	pistol	A	suicide
A ₁	B	sledgehammer	B	yes
A ₁	B	sledgehammer	B	yes
A ₂	B	neck of a bottle	A, B	yes
B	A ₁ B	knife	A, B	yes
A ₁	0	knife	0	yes
B	A ₁	belt	A, B	yes, see Fig.
A ₂	not known	stick for strangulation	A	
0	A ₁	belt	A	yes
A ₂ B	A ₁	knife	A	yes
0	A ₁	telephone cable	A	yes



Belt
Adhesive strip
Anti-A with
A erythrocytes



Belt
Adhesive strip
Anti-B with
B erythrocytes



Belt
Adhesive strip
Anti-H with
O erythrocytes