Lifting techniques for finger marks on human skin previous enhancement by Swedish Black powder – A preliminary study

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อาจารย์ที่ปรึกษา

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Introduction

- At the crime scene the finger marks are one of the most common forms of evidence.

- According to forensic literature human skin is one of the least convenient surface for recovering bridge skin impressions.

Introduction

- **Sampsom et al** : Recovery of latent fingerprint evidence from human skin.

- **Delmas** : Latent print recovery from skin surfaces.

- **Mashiko and Miyamoto** : Latent fingerprint processing by the ruthenium tetroxide method.

Objective

- Study on fingerprints deposited onto human skin of living subjects.

- Study is to determine the best lifting processes for treated finger marks by Swedish Black.

Materials and methods

forensic light source

↓ white light

labelled with a number

↓ 2 male , 2 female (35-40)

deposited fingerprint on the wrist

↓ T. 22-26 º C

relative humidity 60 %

contact time 3-5 s at once ,1 and 4 h

Materials and methods (cont)

Swedish black powder

↓ 100 /250 mg , Round fingerprint

Lifting techniques

↓
- White instant lifter
- White fingerprint gelatin
- Black fingerprint gelatin
- Silicone
- Transparent adhesive tape

Recorded by Canon EOS 5D

Enhancement methods

1. Visual examination

2. Powder / brush

3. Lifting method

Visual examination

- used prior to other methods
- the latent prints were examined using white light

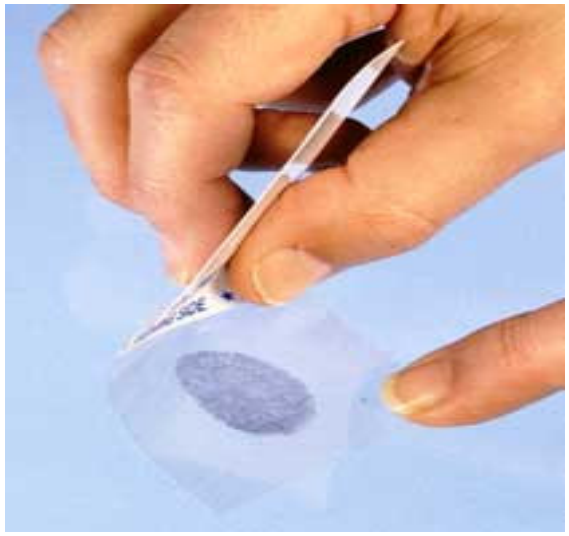
Powder / brush

- Swedish Black powder (100/250 mg)
- round fingerprint brush.

Lifting method

- white instant lifter
- white fingerprint gelatin
- black fingerprint gelatin
- silicone
- transparent adhesive tape

white instant lifter



white and black fingerprint gelatin

Silicone

Transparent adhesive tape

Results and discussion

Table 1
The quality of recovered finger marks on the human skin secured with different lifting techniques.

Lifting technique	Time	Sample (number)	Finger mark graded: ++ %	Finger mark graded: + %	Finger mark graded: – %
White instant lifter	At once	18	11	39	50
White instant lifter	1 h	15	7	20	73
White instant lifter	4 h	15	13	27	60
White fingerprint gelatin	At once	20	35	40	25
White fingerprint gelatin	1 h	12	17	42	41
White fingerprint gelatin	4 h	12	8	34	58
Black fingerprint gelatin	At once	12	40	43	17
Black fingerprint gelatin	1 h	-	-	-	-
Black fingerprint gelatin	4 h	-	-	-	-
Silicone	At once	18	54	40	6
Silicone	1 h	16	31	44	25
Silicone	4 h	14	35	43	22
Transparent adhesive tape	At once	11	18	37	45
Transparent adhesive tape	1 h	10	10	30	60
Transparent adhesive tape	4 h	10	20	20	60

- Recovered finger marks where the entire profile of the friction ridge can be observed on transfer (++)
- Recovered finger marks where a partial profile of the friction ridge can be observed on transfer (+)
- No observed marks on transfer (-)

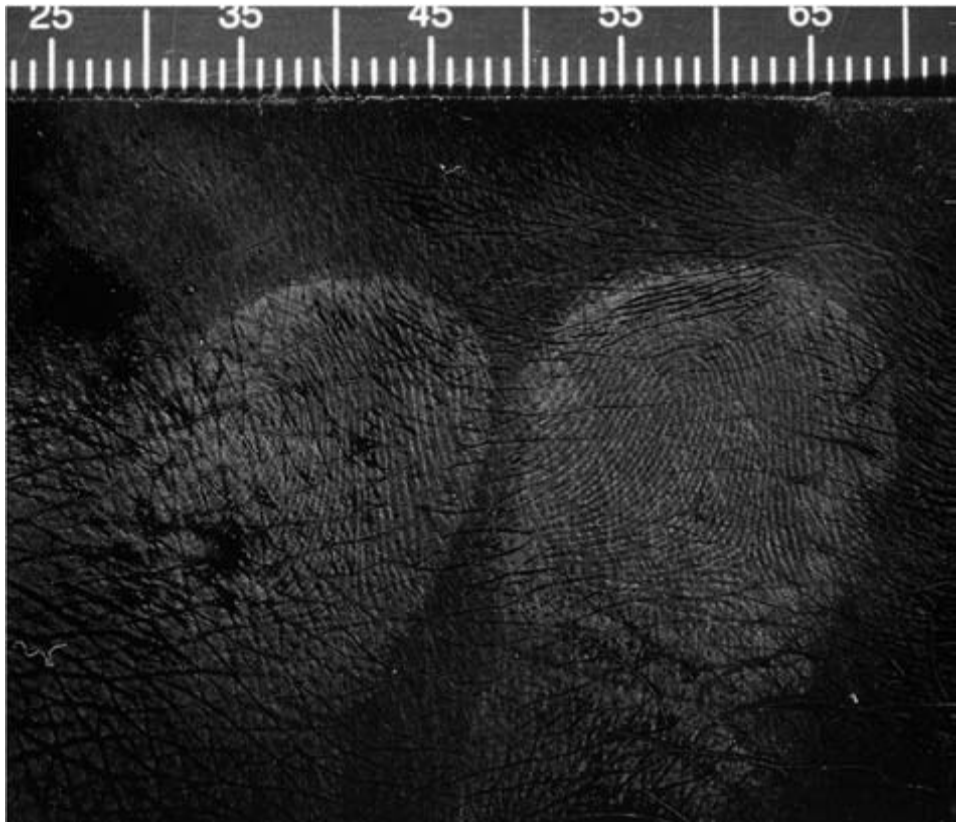
Results of the experiment by shares of usable finger marks with regard to lifting techniques

Immediate lifting and transfer of finger marks

Lifting technique	Sample	Finger mark grade (++,+ %)	Finger mark grade (-%)
White instant lifter	18	50	50
White fingerprint gelatin	20	75	25
Black fingerprint gelatin	12	83	17
Silicone	18	94	6
Transparent adhesive tape	11	55	45

Finger mark lifted by white instant lifter.

Finger mark lifted by black fingerprint gelatin

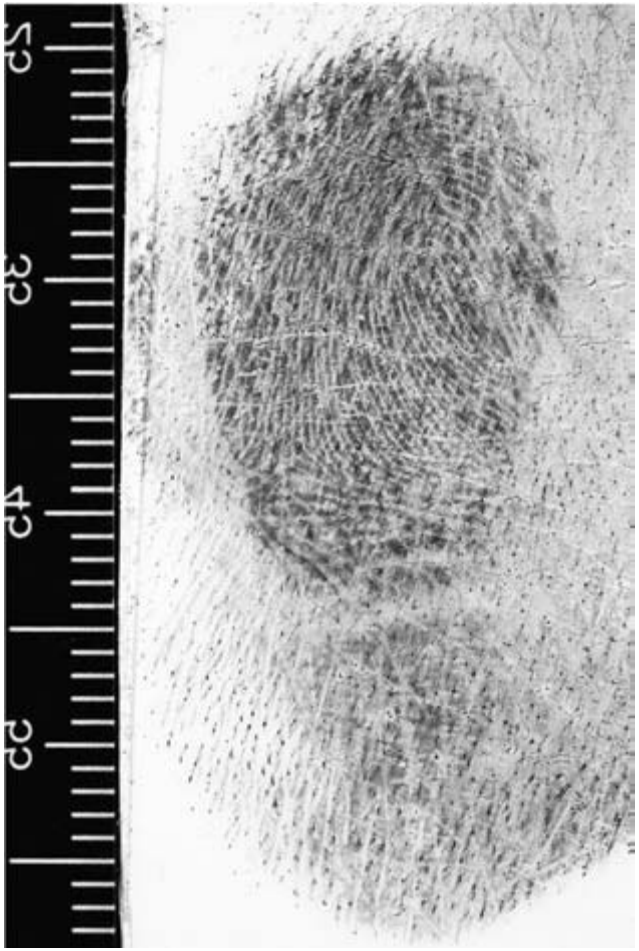


Finger mark lifted by silicone

Lifting and transfer of finger marks after 1 h

Lifting technique	Sample	Finger mark (++,+ %)	Finger mark (-%)
White instant lifter	15	27	73
White fingerprint gelatin	12	59	41
Black fingerprint gelatin	-	-	-
Silicone	16	75	25
Transparent adhesive tape	10	40	60

Finger mark lifted by white fingerprint gelatin after 1 h.



Lifting and transfer of finger marks after 4 h

Lifting technique	Sample	Finger mark (++,+ %)	Finger mark (-%)
White instant lifter	15	40	60
White fingerprint gelatin	12	42	58
Black fingerprint gelatin	-	-	-
Silicone	14	78	22
Transparent adhesive tape	10	40	60

Overall average value performance rating for different lifting technique.

Lifting technique	Overall average value performance rating
White instant lifter	1.49
White fingerprint gelatin	1.78
Silicone	2.23
Transparent adhesive tape	1.60

Conclusions

- Powder dusting remains the basic and least complicated method for the recovery of fingerprints from the skin.

- The best transferring results were obtained with silicone and white fingerprint gelatin.

Conclusions

- Poor results were obtained using white instant lifter and transparent adhesive tape.
- Future work will investigate these lifting techniques on skin surface of dead bodies.

THANK YOU

QUESTION