FORENSICONS
Forensic-medical consultancy and assessments

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Preliminary report
on the forensic-medical analysis concerning an injury of
VENTOSO Francisco, born on 06.05.1982, Spanish racing cyclist

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Dear Mr. de Kock

You asked me to assess a soft tissue injury on the left lower leg of Francisco Ventoso, which occurred after an incident during the cycle race Paris-Roubaix in 2015, from a forensic-medical perspective on the basis of documents. I shall express my opinion, if possible, on how and due to which structure contact this injury may occurred. The central question is whether a disc of the disc brake mounted on the other competitor's racing bike could possibly have caused this injury.

You have made the following documents available for this purpose:

- Picture of the fresh injury of F. Ventoso*
- Picture of the injury of F. Ventoso after wound care *
- Picture of the injured F. Ventoso after the accident*
- Report (Spanish and English) from F. Ventoso concerning the origin of this injury from his perspective

* these pictures are publicly available, as they can be found on the internet. Therefore they can be used for the analysis without explicit approval of F. Ventoso.

- Photographically documented reconstruction attempts with possible contacts of the racing bike structures with the left lower leg of a test person.

Important preliminary notice: This analysis is exclusively based on the available documents. They are incomplete, as medical reports about the actual wound appearance before wound care are missing. The analysis of pictures alone is maybe containing errors. Additionally only the report of F. Ventoso is available concerning the sequence of events. I do not know what the „collision partner“ has seen and whether he actually fell down with his bike.

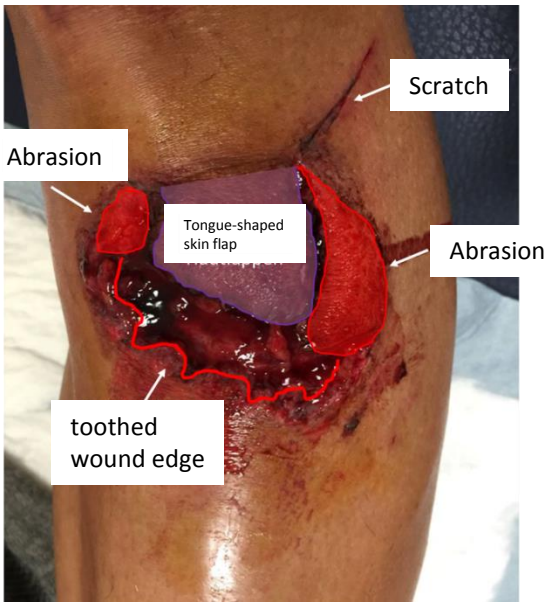
Anyhow I am of the opinion that in terms of a **preliminary report** essential statements on the origin of this injury are possible from a forensic-medical perspective.

1. Injury of F. Ventoso

It is an injury of soft tissue on the front of the left lower leg, slightly left from the centre line.

Picture 1: Injury of the left lower leg, overview

Pict. 2a Detailed view of the wound



Pict. 2b Wound characteristics

The wound is a bottom-up **tangential detachment of a skin flap** with an intact connection to the unaffected skin at the upper end. The tongue shaped skin flap (coloured purple in pict. 2b) was contracting after the detachment from the soft tissue and eventually also from the periosteum, why its surface seems to be „wrinkly“ and the lower edge is not precisely demarcated. On the sides two skin **abrasion zones** are assumed, which are shown as red areas in the pict. 2b. Especially remarkable is the **toothed (jagged) wound edge** of the skin. On the upper side the wound is ending in a diagonally scratch pointing up- and outwards, which is also still very visible after the wound care (pict. 3).

Pict. 3 Wound closed with metal clamps after wound edge excision

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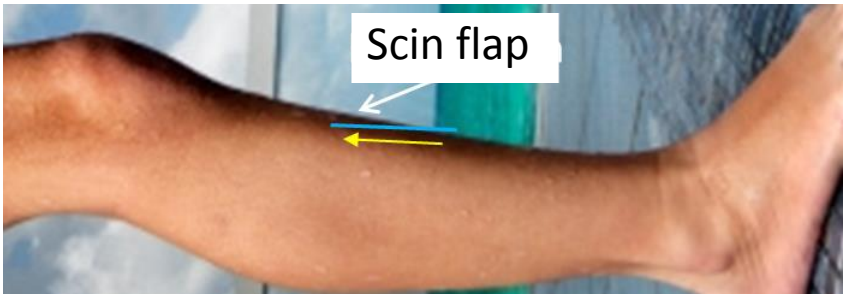
Picture 3 shows the injury after wound care with metal clamps. The ragged and squeezed wound edges have been most likely cut (excised), whereby a **triangular skin flap** resulted. A blue cloth strap was laid into the wound in order to allow the wound secretion to be drained. The skin scratch at the top left position is still very visible.

1.1. Severity level of the injury

A **soft tissue wound** caused by sharp impact is present that should heal without complications if there is no wound infection. From a medical point of view it is a **minor injury**, from a legal perspective it is a **minor bodily injury** (*einfache Körperverletzung*) according to the Swiss Criminal Code (StGB).

2. Impact direction to the lower leg

(Side definitions such as „right“ and „left“ always refer to the view of the injured person).
A sharp and flat object (pictured in blue) separated the skin flap with an impact from below. This direction is indicated with a yellow arrow in pict. 4.



Pict. 4 Impact of the sharp and flat object (blue)

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The sharp and flat object impacted **from the lower right side**. Two stages of impact are shown in the pict. 5 and 6. The impacting object is pictured as blue matter without specific edge structure.

Pict. 5: The object cut from the lower right side into the skin and separated the skin flap up to the intact upper part

Pict. 6: Movement to the upper left side: resulting in a skin scratch

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2. Accident details from F. Ventoso

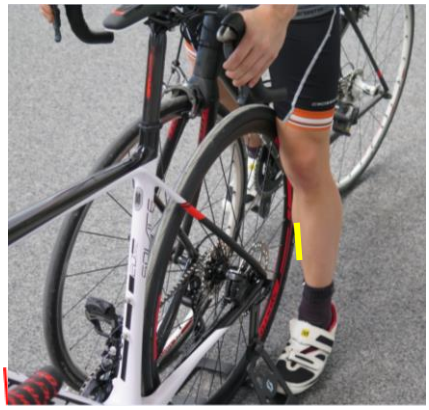
I received an undated “open letter” of F. Ventoso for review. In this he criticises the use of disc brakes on racing cycles.

Concerning the accident during the cycle race Paris-Roubaix he states that at km 130 several riders tumbled. He was able to brake, but he couldn’t prevent a collision with a competitor in front of him, whose bike was equipped with disc brakes. Literally F. Ventoso said *„I didn’t actually fall down: it was only my leg touching the back of his bike. I keep riding……“*

3. Reconstruction attempts

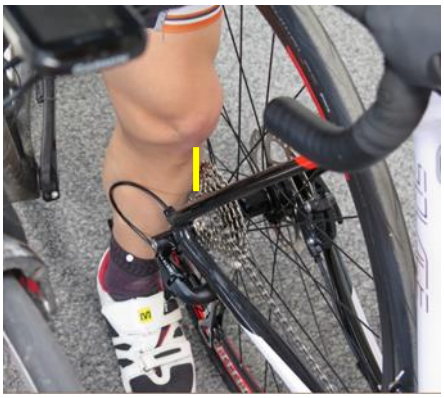
In the pict. 7 to 11 I show your photographs of attempts to demonstrate the contact between the left leg of a human and a potential “suitable” impacting object of a racing bike. I made a selection of pictures and chose only those that fulfil the criteria of a sharp and flat” object.

Thereby the focus has to be laid on the **direction of possible impact** (each indicated yellow at the left lower leg) to compare it with the direction indications in the pict. 4 to 6. Thereby it is important to keep in mind, that the injury was on the left lower leg and discs of disc brakes on bicycles (including that of Team DirectEnergie, “collision partner” of F. Ventoso, as I was told) are always mounted at the left side of the wheels.

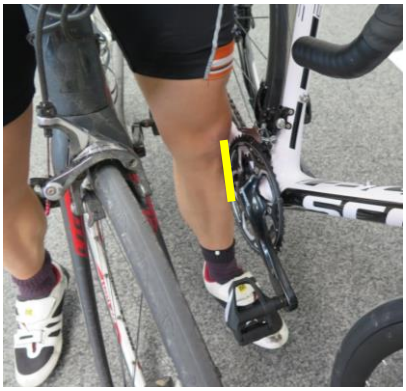


Pict. 7 Disc brake back wheel (wheel would be between legs)

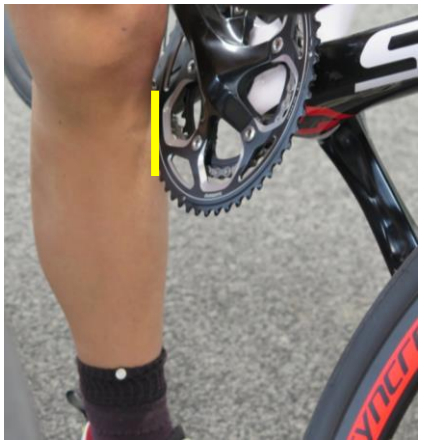
Pict. 8 Disc brake back wheel with **„upside down“ position** of the bike of the collision partner.



Pict. 9: Contact with the gear rims at the back wheel



Pict. 10: Contact with the front gear rim with upright racing bike



Pict. 11: Contact with the front gear rim of a racing bike tilted to the left

Pict. 12: My reconstruction attempt with the (chainless) large front gear rim which is located at the right side of the bicycle. Red arrows: if the leg is moving to the front an upwardly directed injury occurs.

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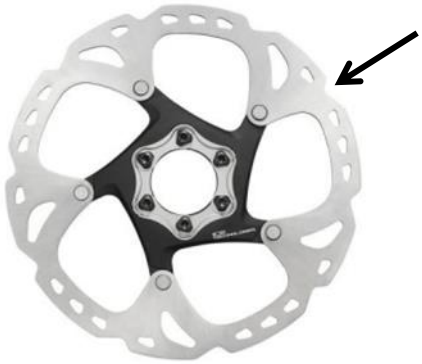
Pict. 12 shows a reconstruction attempt suggested by me. In this case the skin contact at the left lower leg occurs with the frontal (chainless) **gear rim** on the upper side on hub level.
Only with this attempt the **horizontal impact of the gear rim on the wound's skin is corresponding**. If the test person is moving the leg to the front a sharp tangential bottom-up impact and separation of the skin flap can occur.
Another possibility (which is not pictured here) is the contact of the left leg with the bottom side of the gear rim. This would be possible in case the leg is hitting a heavily tilted or lying racing bike.

4. Edge structure of the impacting object

A wound caused by sharp impact, i.e. due to the impact of a flat disc made of metal with a sharp edge causes a smooth wound edge. If in the present case a disc brake had been the reason for the wound I would have expected flat and smooth wound edges. But this is not the case, shown in pict. 2b on page 3. Clearly visible is in this picture the toothed shape wound edge in the lower area, where the impact started.
A disc brake is punched from flat metal (approx. 2-3 mm) and thus sharp at the edges like the back of a knife. It just has a few waves at the disc edge that are not jagged. In pict. 13 a model of the manufacturer Schimano is shown. It is probably not identical to the discs, mounted on the bicycles of Team DirectEnergie:



Pict. 13: Bicycle disc brake with wavy edge structure (arrow)

On the contrary a gear rim is jagged and the jags are sharp. In contact with the skin they can cause jagged or toothed wound edges. Pict. 14 shows a possible interaction.

Pict. 14. Superposition of a gear rim over the wound. The jagged wound edge (red line) would be easily explainable by the jags of the gear rim.

Remark: Due to the lack of calibrated photos and non-unified shooting angles this depiction is **not in scale.**

5. Conclusion of the preliminary forensic-medical assessment of the supposed reason for Mr. F. Ventoso's leg wound

a) It is an injury of soft tissue on the front of the left lower leg caused by the impact of a sharp object.

b) From a medical point of view it is a minor injury if no wound infection occurs. From a legal perspective it is a minor bodily injury (*einfache Körperverletzung*) according to the Swiss Criminal Code (StGB).

c) The impact of the sharp object occurred bottom-up, almost parallel to the leg axis and (from the patient's view) slightly from the lower right to the upper left side.

d) With this impact a tongue shaped skin flap was separated from below and sideways.

e) The reconstruction attempts showed that the injury caused by a disc of a disc brake couldn't be reasonably explained. The **left** leg was injured by an impact with another bicycle with disc brakes on the **left** side of the wheels.

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f) Both the bottom-up impact and the jagged (toothed) lower wound edge are in contrast well explainable by the impact of the chainless front gear, in particular if the leg of the injured person is moved to the front.

g) A definite statement concerning the injury emergence requires the viewing of all accident documents incl. medical reports and pictures, the report of the accident participant concerning the course of events and the analysis of the accident participants' original bikes. Potentially also a 3D reconstruction or experiments with bicycles, equipped with disc brakes, of a well-equipped institution e.g. DTC (Dynamic Test Center Vauffelin) or AGU (Working Group for Accident Research Zurich) or a university institute for forensic medicine would be helpful.

h) Every sharp part of a bicycle poses a certain risk of injury. I estimate the risk of a bicycle's disc brake as being lower compared to the risk of the exposed front gear rim.

With kind regards

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