

Linköping, Uppsala and Cardiff, 24th July 2013

To The Hammarskjöld Commission
Attn. The Rt. Hon. Sir Stephen Sedley

MEDICO-LEGAL ASPECTS ON THE DEATH OF DAG HAMMARSKJÖLD

Instruction

We have been asked by the Hammarskjöld Commission to prepare a report on the medico-legal aspects of the death of the UN Secretary-General, Dag Hammarskjöld, following the crash of SE-BDY near Ndola Airport on 17th September 1961. The instruction for the report was given in a letter from you, 25th February 2013 and from Bea Randall, Secretary to the Commission, 5th February 2013.

This report is a joint document reflecting the common opinion of the three of us. It relates to the medical aspects of the enquiry and, in particular, to the pathological investigations.

In particular, we have been asked to address:

- a. The likely mechanism of fatal injury to Dag Hammarskjöld.
- b. Whether there are any issues which require further evidence before any conclusions can be drawn.
- c. What inconsistencies appear from the existing reports and other enclosed materials.
- d. How the earlier investigations compare to modern standards of forensic analysis.

Having read the book "Who Killed Hammarskjöld" by Susan Williams, published in 2011, we are aware that questions before the Commission include:

1. Why did Dag Hammarskjöld have no burns, whilst the other victims were so severely charred?
2. Whether there is any evidence to corroborate the claim by Major General Björn Egge that he had seen a bullet hole in Dag Hammarskjöld's forehead.
3. Why the injury described by Major General Egge was not visible on any photographs of Dag Hammarskjöld.

4. Whether a playing card (an “ace of spades”) had been placed on Dag Hammarskjöld’s body and why no mention of a playing card was made in the medical reports.
5. Whether any part of the post-mortem examination records was unavailable.
6. Whether the presence of leaves in Dag Hammarskjöld’s hands has any significance.
7. Whether the pallor around the right orbit of Dag Hammarskjöld in two photographs had any significance and whether they might indicate that the photographs had been “re-touched”.
8. Whether Dag Hammarskjöld had been found at an anthill.
9. Whether Dag Hammarskjöld was capable of moving to the place where he was found.
10. Why no photographs were taken – or available – of Dag Hammarskjöld’s body in the position in which he was found.
11. Why no X-rays were available of Dag Hammarskjöld when the pathology reports indicate that they were made.

Materials

The Hammarskjöld Commission has supplied to us the following materials:

1. Report by the Investigating Board of the Department of Aviation, Federation of Rhodesia and Nyasaland, with appendices. Appendices of particular relevance include:
 - Wreckage plan (page 40).
 - Exploded diagram of wreckage plan (page 42).
 - Report of ballistics expert (page 127).
 - Summary and conclusions medical report (page 167).
2. Report of the Commission of Inquiry, Federation of Rhodesian and Nyasaland, with appendices.
3. Report of the Commission Investigation into the conditions and circumstances resulting in the tragic death of Mr Dag Hammarskjöld and of members of the party accompanying him. United Nations General Assembly 24th April 1962 with annexes 1 to 16 (medical information: annex 7, page 103, report prepared for the Swedish Royal Medical Board, A. Frykholm and N. Ringertz).
4. Photographs of Dag Hammarskjöld’s body at the crash site of the Albertina and in the morgue. These are believed to have been taken by the police photographer at the time of the crash and copies were located in the Roy Welensky papers at Rhodes House, Oxford University, by Dr. Susan Williams.
5. Photograph of one of the crash victim’s bodies with bullet wound. This was taken and given to the Commission by the former Northern Rhodesian police officer who helped in the search for bodies at the crash site.
6. Memorandum submitted to UN investigation, written by UN Consultant Dr Hugo Blandori. This was found in a private archive by Dr Williams but is not mentioned in any of the official reports.

7. Note written by Northern Rhodesian journalist Marta Paynter in 1965 which gives a description of Dag Hammarskjöld's body at the crash site.
8. Testimony by Donald Matthew McNab, Hugh Douglas-Ross and Dr Mark Leytham-Lowenthal, taken from the verbatim records of the hearings of the Rhodesian Commission of Enquiry, 1962.
9. Preliminary medical report of the Federal Director of Aviation, written by Ross, Stevens and Smith, 27th September 1961.
10. Report on medical investigation of the accident to Transair D6-CB, 1961. Written by Ross, Stevens and Smith for the Rhodesian investigations. Contains X-rays of bodies 1, 2, 6, 12 and 14.

We have been informed that the Hammarskjöld Commission requested that we be granted access to the autopsy report that was prepared after the crash, held in the Swedish National Archive. The request was denied by the Archive with reference to a provision in the Swedish legislation on access to official documents and secrecy (SFS 2009:400). The Commission appealed against this decision. The Court of Appeal quashed the decision and suggested that it was obvious that several details in the material was of such nature that they could be made accessible without there being a conflict with the provision invoked. The case was therefore remanded back to the Archive for a new examination. Eventually the Archive released some of the material requested. Based on this information we were able to conclude that this material does not contain any information other than that listed above. No further X-ray pictures have been presented.

Position of the body of Dag Hammarskjöld at the crash site

The DC-6B aircraft in which Dag Hammarskjöld and his company were travelling, crashed at about 00.15 local time Monday 18th September 1961 about 12 km west of Ndola airport. After observation from the air by a searching airplane the wreckage was found by the Northern Rhodesian police at 15.45 local time, i.e. about 15 ½ hours after the crash. From that moment, the wreckage and the surroundings were guarded day and night by the police.

However, during the night after the crash and the following day until the detection of the aircraft, there was free access to the site. It is not known what has happened to the victims during that time. This was particularly well illustrated in Annex VIII "Statements of witnesses relating to a second aircraft" in Report of the Commission of Investigation to the United Nations General Assembly. This document describes the presence of a native group, the Ndola West charcoal burners who were attending their kilns in the bush that night within a mile or two of the crash site. Many of them report that they had observed two jet aircrafts taking off from Ndola airport shortly after the DC-6B had passed over. They report having heard bangs and seen the crash and the subsequent fire. At dawn, three of the men, Mr. Banda, Mr. Daka and Mr. Moyo went to the crash scene, but they did not report it. Mr. Daka carried away a code machine from the wreckage, which he tried to sell, thinking it was a typewriter. The men were arrested and sent to prison for theft or as accessory to theft.

The wreckage plan sketched by the police shows the details of the crash site, where the various victims were found. Nr. B8 indicates the position of Dag Hammarskjöld, which is at the periphery of the wreckage area, close to the rear of the airplane. In a note written by the Northern Rhodesian journalist Marta Paynter in 1965, she describes Dag Hammarskjöld's body after the crash "half sitting against a giant ant-hill". On the wreckage plan there is no indication of an ant-hill.

In the autopsy report there is a note that all the bodies were marked by the police and photographed. These photographs and any verbal technical description of the wreckage scene are not present in the documentation presented to us. The position in which Dag Hammarskjöld's body was found therefore cannot be determined from the material available.

Report on the Medical Investigation of the Accident to Transair DC-6B, Registration SK-BDY (Autopsy report)

A medical investigation with medico-legal autopsy of all the 16 victims was performed between 21-24 September 1961 by Drs. H. Douglas Ross, P. J. Stevens and J. Hillsden Smith. The investigation was undertaken on the order of the Director of Civil Aviation, Federation of Rhodesia and Nyasaland.

Examination of Dag Hammarskjöld

Identification

The body, numbered No. 8, was formally identified by Colonel B. Egge as that of Mr. Dag Hammarskjöld and was also viewed by Mr. Knut Hammarskjöld, his nephew. The teeth were not removed for identification purposes.

Clothes and external material

In the autopsy report Mr. Dag Hammarskjöld's clothes were described as follows: "White shirt, greenish tie, fawn drilled trousers, white underpants, brown socks. The garments were very little damaged excepting for some blood and mud staining. There was no jacket".

Six black and white photographs are available showing Dag Hammarskjöld after death. They are believed to have been taken by the Northern Rhodesian police. Blood has not been wiped away from the skin making interpretation of the injuries more difficult. In three of the photos Dag Hammarskjöld has been moved from the place where he was found and is lying on his back on a stretcher with clothes on, surrounded by scrub vegetation. The other three photos are taken with the unclothed body on mortuary table.

The first three photographs are all taken from the front. They do not show any evidence of burning of the clothes. Some small stains, probably blood and mud, are seen on the upper front of the trousers and on the right side of the front of the white shirt. The clothes are not displaced and are undamaged. Around the waist there is a dark belt (done-up and undisplaced). The sleeves of the white shirt are buttoned at the wrists. There is a metal chain around the right wrist and a watch on the left wrist.

In all three photographs an object resembling a playing card is visible on the right side of the front of the neck appearing to lie underneath the tie. No details of the object are visible. This object had been identified by witnesses as an Ace of Spades.

On the right side of the thorax a 20 - 30 cm long twig is visible. In lying on the left side of the thorax, the left hand grips what appears to be vegetation including leaves. This suggests that his hand had been in contact with the leaves on the ground after death as rigor mortis developed.

External injuries

The autopsy report describes the following external injuries:

“The face, neck and shoulders showed intense congestion and post mortem lividity. The head showed considerable bruising of the forehead and over the right side of the face, with some superficial abrasions. There was a deep cut over the bridge of the nose extending beneath the left eye. There was a linear abrasion along the angle of the left jaw. The nose was broken but other facial bones were intact and all teeth were present. There were small lacerations in the middle of the lower lip and to the left of the point of the chin. There had been bleeding from the nose and mouth but none from the ears. There was no scalp wound.”

“There were no injuries to the external chest wall anteriorly, but there were a few abrasions posteriorly. There was a small subcutaneous bruise over the lower right costal margin.”

“In the upper limbs there were a few minor abrasions around the right elbow and down the forearm, and a large abrasion on the outer aspect of the dorsum of the right hand. There was a circumscribed bruise over the point of the right shoulder and minor abrasions on the outer aspect of the left arm, forearm and hand. All finger nails showed very marked post mortem lividity.”

“There was no injury to the anterior abdominal wall except for a minute abrasion in the left hypochondrium just beneath the costal margin.”

“There was very marked post mortem lividity of the toe nails. Both lower limbs had a number of minor abrasions scattered over their whole length, most marked on the lateral aspects.”

The three photographs taken in the mortuary show two to three streams of blood ½ to 1 cm broad running horizontally over each side of the face. From the right nostril and corner of the mouth blood streams have run towards the right ear. On the left side blood has run from the base of the nose towards the left ear. The right arm was held outwards with the elbow strongly flexed and the hand about 30cms to the right of the head. The left arm was also held outwards with the elbow strongly flexed and the hand flexed on the left side of the thorax.

This position suggests that the body had lain on its front and to the right after death as rigor mortis was developing. The distribution of lividity supports this theory, as do the areas of pressure pallor on the inside of the right arm and the right side of the thorax (but sparing the back). However, documentation and photographs of the position of Dag Hammarskjöld when he was found at the crash site are absent.

The horizontal direction of the blood trails on both sides of the face suggests that the body was lying supine at some time before taking of the photographs. Considering the previous opinion that the body had been placed on its front this could suggest that that body could have been turned around at some moment. The direction of the blood trails is not consistent with the body having been in a semi-upright position, such as being sat up against an ant-hill, as they formed. The distribution of blood runs, the location of apparent pressure pallor and the position of the upper limbs suggest that Dag Hammarskjöld's body has been both face down for a period but also face up, with the head roughly level.

Internal injuries

The following internal findings are described in the autopsy report:

"There were extensive hematomata over both temporal regions [of the scalp] and the whole scalp appeared grossly congested. There was no fracture of the skull. There were no signs of external injury about the neck, and the cervical spine was intact."

"The body of the sternum was fractured between ribs three and four and there was a small hematoma beneath this fracture. All the ribs on the left had multiple fractures anteriorly, laterally and posteriorly; all those on the right had fractures paravertebrally and several had multiple fractures laterally and anteriorly, in addition. There was a complete fracture dislocation of the thoracic spine between T2/T3. The fracture line ran obliquely upwards and from behind forward through the anterior part of the body of T2."

"There was no fracture in either upper limb. There was a fracture of the left femur at the junction of the middle and lower thirds but no hemorrhage at this site. There was no fracture of the right leg. The lumbar spine and bony pelvis were intact. The external genitalia were uninjured."

"There was a relatively localized subdural hematoma over the middle of the right cerebral hemisphere and generalized subarachnoid hemorrhage but no extradural hematoma. The brain was congested but otherwise normal. The spinal cord was not specially examined, but was clearly damaged at the site of the thoracic spinal injury."

"The glottis and trachea were congested but there was no laryngeal injury. There was some congestion and bruising of both lungs but no lacerations. There was a bilateral haemothorax of between 500 – 700 ml. The pericardium was normal and the heart uninjured except for a doubtful subendocardial haemorrhage on the intrauricular septum. The myocardium, valves and coronary arteries were healthy."

"The diaphragm was intact. The liver, spleen, kidneys, oesophagus, stomach and intestine, bladder, and pelvic contents were uninjured. There was no free blood in the peritoneum."

"The thyroid, suprarenals, pancreas and pituitary were all uninjured and appeared normal. "

Special investigations

According to the autopsy report the whole body was X-rayed for the presence of foreign bodies, but none was found. No X-ray pictures from Dag Hammarskjöld are present in the materials.

Histological preparations and carboxyhemoglobin estimations were made at the Department of Aviation Pathology, R.A.F. Institute of Pathology and Tropical Medicine, Halton, Bucks., England.

Material from most organs of all bodies was examined histologically. No evidence of preexisting disease was found in any case and in particular in any member of the flight crew. The lungs of all bodies showed varying degree of intra-alveolar hemorrhage, edema, traumatic emphysema and patchy collapse. Moderately severe fat embolism and bone marrow embolism were found in the lungs of ... No. 8...i.e. Dag Hammarskjöld.

The carboxyhemoglobin level in the blood was 2 percent. The origin of the blood (heart or other) was not indicated.

No opinion of the direct cause of death of Dag Hammarskjöld is given in the autopsy report, nor of the possible survival time or the possibility of moving after the his injuries were sustained.

Examination of the other 15 victims

The identity of all the victims was ascertained.

All the other 15 victims except Dag Hammarskjöld had burn injuries, many were severely charred. One person survived for five days in hospital and died from renal complications of burn injuries. Nine bodies had severe traumatic injury as to preclude survival even if no fire had ensued. Three bodies were so severely burned that it was not possible to assess any injuries. In four bodies no lethal injuries were found, but the victims appeared to have died immediately. There was evidence from the examination of the wreckage that six of the victims had been wearing seat belts.

No health problem in the flight crew was detected. The toxicological tests did not suggest intoxication.

Very low levels of carboxyhaemoglobin was present (up to 7 per cent) which indicated that carbon monoxide toxicity did not affect the crew, that there was no indication of an in-flight fire and that the levels found did not give evidence of survival with inhalation of fire fumes after ground impact.

Bullets were found within the superficial tissues of two bodies and cartridge cases and percussion caps were found in three of the bodies. The location indicated that the material had not been fired into the bodies but had come to lie in their locations as a result of explosion of ammunition following ground impact and the subsequent fire. This is supported by ballistics examination of the bullets, their appearance and location in the body and the lack of any bullet 'track' or related bleeding.

Witness information about a possible bullet hole in the forehead of Dag Hammarskjöld

According to Susan Williams book "Who killed Hammarskjöld?" in 2005 Major General Björn Egge, a Norwegian who had been the UN's head of military information in Congo in 1961, made a statement in the Norwegian newspaper "Aftenposten". He said that straight after the crash of Dag Hammarskjöld's airplane he had been sent to Ndola to collect the Secretary-General's cipher machine and his brief case. He had then been allowed to see the dead body of Hammarskjöld in the mortuary. He said he had then seen a round hole in the forehead that was possibly consistent with a bullet hole. Björn Egge died in 2007.

No injury resembling a bullet hole can be seen in the forehead on the two photographs where this region is shown. There is a small, somewhat irregular, dark area approximately 0,5 x 0,2 cm. about 2 cm. above the rim of the right eye. From the photographs, it cannot be determined if this finding represents a laceration, an abrasion or a blood stain.

It is well known that entry wounds of bullets in the skin can be rather inconspicuous and sometimes smaller than the diameter of the bullet. We consider it unlikely that the appearance of the finding above the right eye represents a bullet entry wound, but this cannot be totally excluded.

Another injury, probably a laceration, about 1 x 0,5 cm, is situated about 2 cm to the left of the point of the chin. A further injury described in the autopsy report, but difficult to see due to blood stains, is situated at the base of the nose beneath the left eye. Again, we consider it unlikely that these might represent bullet entry wounds, but this cannot be totally excluded.

There is also an area with diffusely demarcated pallor around the right eye and on the right side of the front of the head. It has been suggested that this could be explained by retouching of the photograph to hide a bullet hole. Without having any detailed knowledge of such techniques, our interpretation of the finding is that the pale area represents pressure pallor - where the skin has been pressed against a supporting surface preventing the development of lividity. This theory is supported by the absence of blood traces in this area - with trails being seen only in the surrounding areas of the face - and the distribution of the lividity on the rest of the body. The same pale area is seen on the two pictures showing the region in question.

Mechanism of lethal injuries

According to the autopsy report Dag Hammarskjöld showed the following:

- bruising and abrasions of the forehead and right side of the face
- a deep cut over the bridge of the nose extending beneath the left eye
- a linear abrasion along the angle of the left jaw
- small lacerations of the lower lip and to the left of the point of the chin
- fracture of the nose
- minor abrasions of the back, abdomen, arms and legs

- fractures of the thoracic spine with complete dislocation between the second and third vertebrae
- multiple fractures of all the ribs on both sides
- lung contusions
- about 500 - 700 ml of blood in both pleural cavities
- a localized subdural hematoma over the right cerebral hemisphere and generalized subarachnoid hemorrhage
- a fracture of the left femur.
- no natural disease
- no burn injuries
- little evidence of internal injuries

Our opinion is that the appearance of the injuries strongly suggests that they were caused by decelerating force during ejection from the aircraft and subsequent impact of the body against the ground. The presence of bleeding in relation to the injuries suggests that he was alive when the injuries were sustained. Survival would be expected to be only brief, though it is not possible to give a definite time limit. Dag Hammarskjöld was probably unconscious from his head injury directly after the impact.

There is no evidence from the autopsy report that Dag Hammarskjöld had been shot, subjected to explosion or exposed to smoke.

The absence of burn injuries, in the presence of burn injuries of all the other victims, can be explained by the body being thrown out of the disintegrating airplane to a place not involved in the fire. This theory is supported by the absence of marks by seat belts on the body. The extent and nature of his chest injuries would have prevented him from being able to escape the aircraft by his own actions.

The absence of any external injuries to the thorax or any lacerations of the internal organs such as the lungs, heart, aorta or liver is surprising given the massive chest injuries with multiple fractures of all the ribs, the sternum and the thoracic spine. The clothes also look quite untouched. We recognize that trauma to the thorax and abdomen need not result in surface injury, and that it is possible for the skeletal injuries to be more severe than visceral injuries but, nevertheless, this is unusual and reinforces our wish to view the X-ray pictures taken as part of the autopsy and any further autopsy photographs that may exist.

Cause of death

The cause of death is not indicated in the autopsy report.

Our opinion is that the result of the autopsy strongly indicates that the most important cause of death was the "crush injury" to the chest with multiple fractures of the ribs, sternum and thoracic spine, and bleeding into the pleural cavities. This would have led to respiratory failure due to the unstable chest

wall (so called “flail chest”). This conclusion is in agreement with that in the report to the Swedish Royal Medical Board by A. Frykholm and N. Ringertz in 1962.

Required further evidence

In order to give more complete answers to the medico-legal questions raised by the death of Dag Hammarskjöld, the following information would be needed

How, when and by whom was the body found after the crash? Was the body sitting by an ant-hill or lying on the ground? Was he lying supine or on his front? Why are there no pictures of the body? Is there a professional technical description of the site?

Possibly the main contentious issue raised by the materials about the death of Dag Hammarskjöld is the statement of Colonel Björn Egge that there had been a bullet hole in the forehead of Dag Hammarskjöld. It is unclear to us why he did not communicate that suspicion immediately to the authorities and waited till 44 years later to report this critically important finding to a Norwegian newspaper.

Considering the many suspicious circumstances and unsolved questions concerning the death of Dag Hammarskjöld it is of the uttermost importance to get a definitive answer on that point. In the autopsy report it states that X-ray pictures of the whole body of Dag Hammarskjöld were taken, but the pictures are not present in the material available to us, only some of the X-ray pictures of some of the other bodies.

Re-examination of the X-rays of Dag Hammarskjöld, especially those of the head, would answer the question of whether there had been any gunshot injury. Such material might possibly occur in Swedish or British archives. It is also desirable that all X-ray pictures from all the victims should be re-examined.

If the X-ray pictures cannot be retrieved, the only other option is exhumation of the body. According to the Swedish Autopsy Act, an application for exhumation for a medico-legal examination can be decided by a court. Dag Hammarskjöld was buried in the family grave in the Uppsala church-yard, and he has not been cremated. The skeleton is likely to be the only tissue that will remain after the 50 years that have elapsed since his death. This material could be examined by CT scanning.

Computerized tomography (CT) examination is a modern X-ray technique, not available at the time of the Ndola crash that has been available to most medico-legal institutes for the last twenty years or so. It allows an examination of the skeleton in great detail without disturbing the integrity of the body.

Inconsistencies in the documents

No obvious inconsistencies have been found.

Investigation methods compared to modern standards of forensic analysis

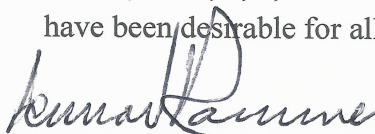
In Susan Williams' book "Who killed Hammarskjöld?" the existence of a more detailed version of the autopsy report is raised, apparently because of the lack of detail in the descriptions of the findings. In our view, there is no doubt that the presented material constitutes the only version of the autopsy report. This is apparent from the formulation in the first page with "Summary and Conclusions" followed by the details of the examinations in the appendices.

The descriptions of the autopsy findings are, however, rather scarce and incomplete. This is particularly so for the description of external injuries, which is very summary. Detail of injury appearance, size, position and orientation is lacking. We accept that the description of autopsy findings nowadays is generally far more detailed than it was fifty years ago, and that national differences exist in the way findings are described and detailed in autopsy reports. However, this lack of descriptive detail is made more significant by the absence of photographs of all of the external and internal findings - though we recognize that these may have been taken, but have now been lost or destroyed.

There are no indications that the quality of the autopsy was other than of good quality, but a review such as this cannot assess whether the interpretations given originally are consistent with the findings if there is no detailed description of those findings and/or no photographs of the injuries (or of photographs demonstrating an absence of injury).

Today more modern methods for the detection of myocardial injury are available as immunohistochemistry. It is however our opinion that such investigations would not add any further information of importance. It appears highly improbable that the crash of the airplane would have been the result of a heart attack of the pilot.

According to the autopsy report all the bodies except the man who survived for five days at hospital were subjected to X-ray examination of the whole body. It was noted that the X-rays would be retained by the Office of the Forensic Pathologist, Salisbury S.R. for a period of two years from the date of the report. As an appendix to the autopsy report selected X-rays (but not including cranial views) of five bodies, Nr. 1, 2, 6, 12 and 14 are enclosed, but no X-rays of Dag Hammarskjöld are available. It would have been desirable for all the X-rays to have been retained.



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