

Need for Revamping Viscera Preservation in India

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Abstract

Viscera is routinely preserved during post mortem examination in cases of poisoning. Since long the quantity and the number of tissues preserved during autopsy have remained unchanged. With advent of new scientific techniques of testing and analysis, the system of viscera preservation in India needs to evolve. The need of the hour is to embrace the technological advancements and use it to protect the time, money and space of government and more importantly preserving the body, integrity and the rights of the deceased.

Keywords: Viscera; Poisoning; Post-mortem Examination; Autopsy.

Introduction

Post mortem examination is an important division of Legal Jurisprudence. Many a times to determine the cause of death, Viscera have to be preserved. The practice of preserving Viscera is since time immemorial. By examining Viscera, many chemicals may be detected, the presence of which may not be apparent during autopsy. Hence, whenever the autopsy surgeon or the Investigating officer suspect any involvement of poison/ chemical agent in causing death, Viscera is preserved.^{1,2}

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Present Knowledge and practice in India

Viscera is preserved on the basic concept of Pharmacokinetics i.e. movement of drug inside the body. Based on this phenomenon different tissues and organs are preserved which are together known as Viscera. Stomach and intestines are preserved as the drug is absorbed through them. To detect the absorption of the drug into circulations, Blood is preserved. Liver is preserved for the metabolism phase and Kidney and urine are preserved to detect the phase of excretion. (Table 1)

Table 1: Routine Viscera

Routine Viscera	Quantity
Stomach with all contents	Whole
Intestine	Proximal 30 cm
Blood	10 ml
Liver	200 - 500 g
Kidney	Half of both
Urine	As much as possible (at least 100 ml)

Besides this in certain poisons, specific Viscera is to be preserved as the pharmacokinetics of these poisons may spread them to particular organs. (Table 2)

Table 2: Special Viscera

Special Viscera	Quantity
Cerebrospinal fluid	As much as possible
Brain	Half (any one hemisphere)
Spinal cord	Whole
Lung	Whole (one lung)
Skin with underlying tissues	Involved part (with 1 cm clear margin)
Long bone	10 cm length
Scalp hair (plucked)	Bunch (around 20 strands)

As per practice these Viscera are routine preserved in glass jars with rectified spirit/ saturated solution of common salt being added as a preservative.

These Viscera are then sealed and handed over to the Investigating officer along with the post mortem report, who deposits the Viscera in the police store room (Maalkhana). After completing

the requisite formalities, the investigating officer transports the Viscera along with post mortem report to a designated Forensic Science laboratory for toxicological analysis. The laboratory then hands over the report to the police officer after conducting the tests. Investigating officer then submits the report to the autopsy surgeon who furnishes the final opinion regarding the cause of death.

Global Recommendations

As outlined in table 3, most of the associations and societies worldwide recommend routine preservation of blood, gastric contents and urine. All other tissues and fluids may be preserved in certain specific conditions only.

Table 3: Recommendations of various associations and societies.

	SOFT / AAFS (3)	UKIAFT (2010) (4)	Guidelines for Collection of Biological Samples for Clinical and Forensic Toxicological Analysis(5)	UKIAFT (2018) (6)	TIAFT (7)	Recommendations for sampling postmortem specimens for forensic toxicological analyses and special aspects of a postmortem toxicology investigation(8)
Brain	50 gm	50 g (volatiles)	30 g	10-20 g (for volatiles)	25 g (volatiles)	50 g (optional)
Liver	50 gm	50 g (only If low volume of blood is available)	30 g	10-20 g (if low volume of blood available)	25 - 50 g	50 g (optional)
Kidney	50 gm	50 g (oxalates)	30 g		25 g	50 g (optional)
Heart blood	25 ml	25 ml (only if femoral blood is not available)	30 ml	25 ml (only if femoral blood is not available)	30 ml	50 ml or All available
Peripheral blood	10 ml	10 ml (femoral)	10 ml	10 ml (femoral)	10 ml	10-20 ml
Vitreous humor	All available	All available	All available	All available	All available	All available (Optional)
Urine	All available	All available	30 ml	All available	30 ml	50 ml or All available
Gastric contents	All available	All available	30 ml of aliquot or 30 g of stomach wall	All Available (or specify if an aliquot) and any examples of undigested tablets/ drug material (including potential plant toxin material)	All available	50 ml or All available

Hair	Not specified	cut from the vertex region of the scalp	150 – 200 strands	to be collected at the start of the autopsy prior to body evisceration. Cut from the vertex region of the scalp maintaining alignment with orientation of strands clearly indicated	100 – 200 mg of hair	A pencil thick tuft (optional) A pencil thick tuft (optional)
Bile	All available	All available	10 ml (if urine is not available)	10ml	All available (if urine is not available)	All available (optional)
Lung	-	-	30 g (for volatiles)	10-20 g (for volatiles)	25 g (for volatiles)	50 g (optional)
Skeletal muscle	-	30 g (in advanced decomposition)	-	10-20 g (if low volume of blood available)	-	50 g (optional)
Spleen	-	-	30 g	-	-	50 g (optional)
CSF	-	-	All available	All available	-	All available (optional)

As can be seen from the above data, more samples (in number as well as size) are being preserved in India as compared to other countries worldwide. The increased number of samples is unscientific and results in requirement of bigger containers/ boxes for packing, issues in transportation, problems of leakage and issues of storage (both before testing and after testing).

There is also the ethical issue of retrieving more samples than are actually required. As per most of the guidelines, the samples preserved should be just adequate to perform one more test, if required. However, in India, samples retrieved may be used to perform multiple subsequent tests. It is actually a violation and mutilation of the dead body in the guise of law and justice.

Recommendation

It is advised the following samples may be preserved routinely during post-mortem examination in cases of poisoning

1. Blood (peripheral) – 10 ml
2. Urine – All available (atleast 100 ml)
3. Gastric wall and contents – All available
4. Vitreous – All available

The remaining tissues should be preserved only if the autopsy surgeon or the investigating officer suspect certain specific poisons.

Brain – 25 g, in poisoning due to volatile agents, CNS stimulants and depressants.

Liver – 25 g, if sufficient amount of blood is not available.

Kidney – 25 g, if sufficient amount of blood is not available.

Bile – all available, if sufficient amount of urine is not available.

Lung – 25 g, in poisoning due to inhalational agents, volatile poisons.

Hair – 50 – 100 strands of hair, in poisoning due to heavy metals.

CSF – all available, in alcohol poisoning.

Skeletal muscles - 25 g, if sufficient amount of blood is not available.

Long bones -10 cm length, in heavy metal poisoning.

Skin and underlying tissues – affected part with a surrounding healthy margin of 1 cm, in case of injections, snake bites.

Conclusion

It is imperative that the age-old practices of Viscera retrieval and preservation need to be transformed. With the advent of novel tools, the requirement of tissues for testing has decreased drastically. The need of the hour is to embrace the technological advancements and use it to protect the time, money and space of government and

more importantly preserving the body, integrity and the rights of the deceased.

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