

## Technical report

# A simple technique for identifying the adrenal glands at necropsy

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### Abstract

There is no detailed and practical description of how to identify the adrenal glands at necropsy. A simple technique is described, based on anatomical location. After removing the aorta by the Rokitansky method, the inferior vena cava is opened. The orifice of the right adrenal vein is identified just above the right renal vein, and a probe is inserted into it as a marker. The right adrenal gland is identified at the centre above the line of the probe after separation of the diaphragm, which is attached to the liver. The left adrenal vein arises as the first bifurcation of the left renal vein after its origin from the inferior vena cava. A probe is inserted into it and the vein is opened along the probe. The left adrenal gland is identified at the left side of the left adrenal vein, embedded in fat. This method is also useful in cases with severe adhesion, fibrosis, or metastases.

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Although their numbers have been decreasing,<sup>1</sup> necropsies are still important for both pathologists and clinicians. There are two major necropsy methods<sup>2-3</sup>: the Virchow method and the Rokitansky method. The latter has the advantage of preserving the relations among the various organs, especially in the vasculature.<sup>4</sup> Identification of the adrenal glands is sometimes difficult for inexperienced pathologists because they are often deeply embedded in fatty tissue. In addition, severe adhesion or extensive metastases may cause difficulty in identifying the adrenal glands even for experienced pathologists. There have been several necropsy textbooks published,<sup>2-5</sup> but to our knowledge there is no detailed description of how to identify the adrenal glands. We present a simple technique of identifying the glands at necropsy by the Rokitansky method.

### Methods

After en bloc removal of the thoracic and abdominal organs by the Rokitansky method, they are placed so that the posterior surface can

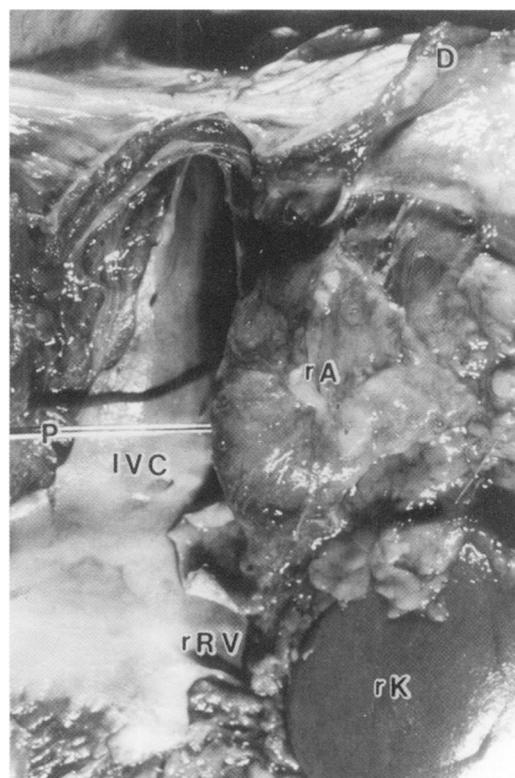


Figure 1 Photograph of posterior view of inferior vena cava (IVC), diaphragm (D), right adrenal gland (rA), right kidney (rK), and right renal vein (rRV). The right adrenal gland is seen in the centre above the line of the probe (P) after separation of the diaphragm.

be examined. After opening and removing the aorta, the inferior vena cava is opened along its length from the iliac veins to around the level of the diaphragm. Both renal veins are also opened. The right adrenal vein arises directly from the inferior vena cava and follows a parallel course. Its orifice can be observed just above the orifice of the right renal vein. A probe is placed in the right adrenal vein as a marker. Since the right adrenal vein leads to the right adrenal gland, the gland (which is usually pyramidal or triangular in shape) is seen in the centre above the line of the probe after separation of the diaphragm (fig 1), which is attached to the liver posteriorly.

The left adrenal vein arises as the first bifurcation of the left renal vein after its origin from the inferior vena cava. A probe is placed in the left adrenal vein as a marker, and the vein is

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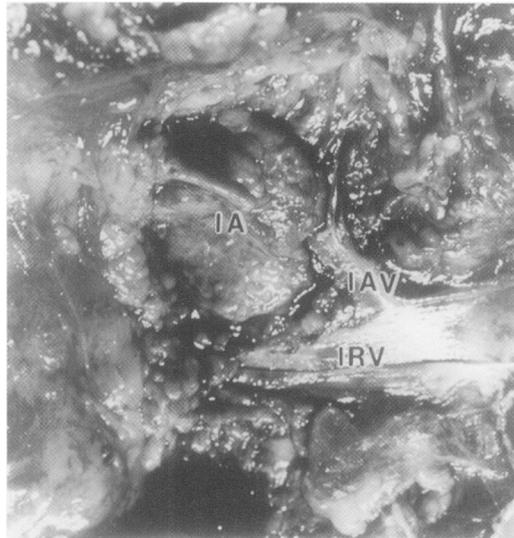


Figure 2 Photograph of posterior view of left adrenal gland (LA), left adrenal vein (LAV), and left renal vein (LRV). The left adrenal gland is seen along the left side of the left adrenal vein.

opened along the probe. The left adrenal gland (usually elongated or semilunar in shape) is identified along the left side of the left adrenal vein (fig 2), embedded in the fat.

#### Discussion

Although the value of identifying the adrenal veins is mentioned in one necropsy textbook in a section on how to identify the adrenal glands,<sup>5</sup> a practical description was not provided. This prompted us to describe our method. The method is especially useful for inexperienced pathologists because it is based on anatomical location, and as long as the

adrenal veins can be identified, the adrenal glands will be found.

The right adrenal vein arises just superior to the right renal vein. According to Davidson *et al.*,<sup>6</sup> the distance between the right adrenal vein and the right renal vein ranges from 2.0 to 6.0 cm (average 4.3 cm). However, these measurements were obtained using venography, and Johnstone noted that when using necropsy materials the average distance was 3.6 cm<sup>7</sup>; this is more in line with our experience.

The left adrenal vein arises from the left renal vein. The distance between the inferior vena cava and the left adrenal vein along the left renal vein ranges from 2.0 to 6.5 cm (average 4.3 cm) according to Davidson *et al.*<sup>6</sup> The distances we have encountered are typically also shorter than this and nearer to the value of 3.1 cm reported by Johnstone.<sup>7</sup> The bifurcation angle between the left renal vein and the left adrenal vein is on average 100°. When these distances and the bifurcation angle are known, our method is easy and practical to apply.

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