



MORPHOLOGY OF SUPERIOR SUPRARENAL ARTERIES

Anatomy

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KEYWORDS

INTRODUCTION-

Due to the functional necessity, the suprarenal glands have a rich vasculature in comparison to their compact size and less weight.^[1] Both glands gain abundant supply via three sources- superior suprarenal artery arising from inferior phrenic artery, a branch of abdominal aorta, middle suprarenal artery arising directly from the anterolateral surface of abdominal aorta and inferior suprarenal artery arising from renal arteries.^[2]

Superior suprarenal arteries arising from inferior phrenic artery are regularly multiple and are given off at the medial border of the gland. Major part of the blood supply comes from these arteries, although it is not always necessary.^[3] Before entering the gland, artery divides, so that the actual arteries piercing the gland may be very high.^[4]

MATERIALS AND METHODS

The study was conducted after getting approval from institutional ethics committee. Informed consent was taken from nearest relative of the deceased for an en-bloc removal of renal block, before autopsy. Adult human cadaveric suprarenal glands (forty pairs) for this study were procured from post-mortem cases in the Department of Forensic Medicine and Toxicology, Vardhman Mahavir Medical College & Safdarjung Hospital.

During medicolegal autopsy, abdominal cavity was opened with a midline incision and intraperitoneal organs were removed to locate retroperitoneal suprarenal glands and kidneys. Superiorly, incision was taken up to T9 vertebra level to involve the origin of inferior phrenic artery.

Whole renal block along with suprarenal glands and vessels were removed and fixed with 10% formalin for further dissection. Morphology of superior suprarenal arteries were observed and tabulated on the basis of:

1. Number of superior suprarenal arteries supplying the gland.
2. Origin of superior suprarenal artery.

Number of Superior Suprarenal Artery:

Superior suprarenal artery was absent in 7 (8.75%) cases, single in 18 (22.5%) cases, double in 36 (45%) cases, triple in 17 (21.25%) cases and quadruple in 2 (2.5%) cases. Majority cases showed double superior suprarenal artery (45%).(Table 1, Figure1).

Table 1: No. of Superior Suprarenal Arteries

No. of SSRA	Left Suprarenal Gland	Right Suprarenal Gland	Total
Absent SSRA	3	4	7
1 SSRA	9	9	18
2 SSRA	16	20	36
3 SSRA	10	7	17
4 SSRA	2	0	2
Total	40	40	80

Origin:

All Superior suprarenal arteries 73 cases (91.25%) were branching off from Inferior Phrenic arteries of their respective sides except in cases where superior suprarenal arteries were absent (8.75%). On left side, Superior suprarenal artery was branching from inferior phrenic artery in 37 cases (92.5%) and on right side Superior suprarenal artery was branching from inferior phrenic artery in 36 cases (90%).

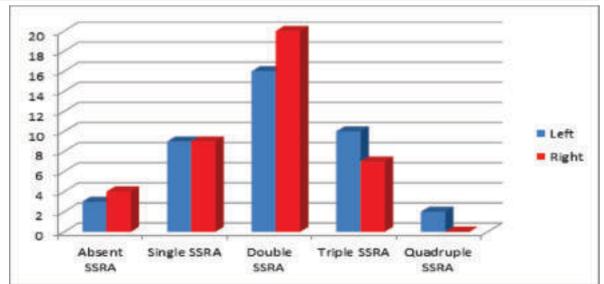


Figure 1: Number of Superior Suprarenal Arteries



Figure 2: Posterior view showing absent Right Superior Suprarenal Artery.

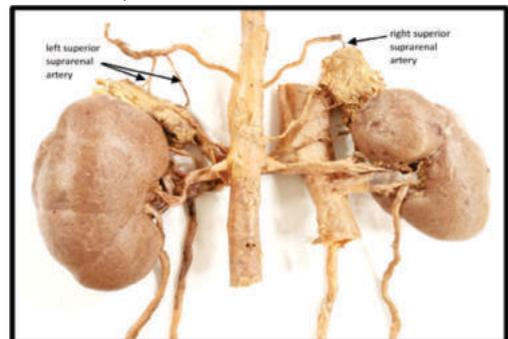


Figure 3: Posterior View showing single Right Superior Suprarenal Artery (RSSRA) and 2 Left Superior Suprarenal Artery (LSSRA).



Figure 4: Anterior view showing 3 superior suprarenal arteries (LSSRA) arising from left inferior phrenic artery (LIPA).



Figure 5: Posterior view showing 4 left suprarenal arteries (LSSRA)

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DISCUSSION

Generally, Superior Suprarenal Artery is multiple in numbers and arises from inferior phrenic artery, a lateral branch of abdominal aorta. Superior Suprarenal Artery was studied and compared under following parameters.

Number of Superior Suprarenal Artery

The present study majority cases showed double superior suprarenal artery (45%). This conflicts with the study done by Manso et al^[5], who observed 4 (40%) and 5 (40%) suprarenal arteries in majority of cases. This might be due to lack of available data on Indian population to the best of our research. In Present study Superior suprarenal artery was absent in 8.75% cases. Absence of superior suprarenal has not been observed in research articles but was documented in Standing.^[2]

Origin of Superior Suprarenal Artery

The present study corresponds with Manso et al^[5], Reddy et al^[6], Dutta et al^[7], Vidyalakshmi et al^[8], Sushma et al^[9] and Toni et al^[10] who found Inferior Phrenic artery as a source in majority of cases. This may be due to the fact that most of these studies were done on Indian population. Anomalous origin of Superior Suprarenal artery from Celiac Trunk^[5, 10], Abdominal Aorta^[5, 6, 7, 10], Splenic artery^[7], intercostal artery^[10] were observed by researchers. No such variations were noted in present study. The present study corresponds with the study done by Vidyalakshmi et al^[8] and Sushma et al^[9] who also found no variations in the origin of Superior Suprarenal Artery.

Table 2: Comparison of origin of superior suprarenal artery with other authors

Studies	Inferior Phrenic Artery	Coeliac Trunk	Abdominal Aorta	Splenic Artery	Intercostal Artery
Manso et al ^[5]	83.3% (L) 86.6% (R)	6.7% (L) 6.7% (R)	10% (L) 3.3% (R)	-	-
Reddy et al ^[6]	98.66% (L) 90% (R)	-	1.33% (L)	-	-
Dutta et al ^[7]	76% (L) 100% (R)	-	18% (L)	6% (L)	-
Vidyalakshmi et al ^[8]	100% (L) 100% (R)	-	-	-	-
Sushma et al ^[9]	100% (L) 100% (R)	-	-	-	-
Toni et al ^[10]	79% (L) 92% (R)	2% (L) 5% (R)	16% (L) 3% (R)	-	3% (L)
Present Study	92.5% (L) 90% (R)	-	-	-	-

CONCLUSIONS

This study suggests that a thorough knowledge of arterial anatomy can assist surgeons for pre-operative judgement while performing surgical interventions like gland excision and transplantations.

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