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Situs Inversus With Rupture Of Cerebral Blood Vessels - A Rare Case Report.

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ABSTRACT

Situs inversus (also called situs transversus) is a congenital condition in which the major visceral organs are reversed or mirrored from their normal positions. Many people with situs inversus totalis are unaware of their unusual anatomy until they seek medical attention for an unrelated condition. The most frequent cause of clinically significant non-traumatic subarachnoid hemorrhage is rupture of a *saccular (berry) aneurysm.*

Here, we present a case of a male, aged 45yrs who complained of severe head ache, collapsed and died at his work place. He was asymptomatic before the incident occurred. At autopsy, it was found that, all the visceral organs of the thorax and abdomen was transposed to the other side, including the heart. Apart from this anatomical variation no other pathological entity was evident. On opening the cranial cavity, it was found that, there was diffuse sub-dural and sub-arachnoid haemorrhage present all over. On further examination, the anterior cerebral artery was found ruptured on the right side at its junction with anterior communicating artery. A combination of situs inversus and berry aneurysm is a rare phenomenon.

Keywords: Situs inversus, Berry aneurysm, Rupture of cerebral vessel

INTRODUCTION

The term situs inversus is a short form of the latin phrase "Situs inversus Viscerum" meaning "inverted position of the internal organs". It is an Autosomal recessive pattern of inheritance.

Generally, patients with situs inversus totallis are asymptomatic and have a normal life expectancy. Prevalence of Situs inversus varies among different population but is less than 1 in 10,000[1].

The most frequent cause of clinically significant non-traumatic subarachnoid hemorrhage is rupture of a *saccular (berry) aneurysm*[2]. Autopsy and angiography studies have found that about 2% of adults harbor intracranial aneurysms, for a prevalence of 4 million persons in the United States; the aneurysm will rupture, producing Sub Arachnoid Haemorrhage, in 25,000–30,000 cases per year. Hemorrhage into the subarachnoid space may also result from vascular malformation, trauma (in which case it is usually associated with other signs of the injury), rupture of an intracerebral hemorrhage into the ventricular system, hematologic disturbances, and tumors[3].

CASE REPORT

A 45-year-old male, complained of severe head ache and collapsed while working in his factory. He was immediately taken to the nearby hospital where he was declared brought dead. The dead body was subjected to Autopsy in Department of Forensic Medicine and Toxicology, Bangalore Medical College and Research Institute, Bengaluru.

Postmortem examination revealed a body of a middle aged male, wheatish in complexion, moderately built and nourished. There were no demonstrable external injuries present over the body. Nails on both the hands showed features of clubbing (Fig 1).



Figure 1 - Clubbing in nails.

On opening the thoracic and abdominal cavity, it was noted that all the visceral organs of the thorax and abdomen was transposed to the other side, including the heart. The liver was on the left side while the heart and the spleen were present on the right side (Fig 2).



Figure 2 - Transposition of visceral organs

Apart from the transposition of the visceral organs, there was no gross pathology in any of the organs. Stomach was empty, with normal mucosa.

On removing the cranial cavity, it was observed that there was diffuse Sub-dural and sub-arachnoid hemorrhage present all over the brain (Fig 3).



Figure 3 - Diffuse Sub-dural and Sub-arachnoid hemorrhage

On further examination, it was noted that there was numerous aneurismal spots present over the cerebral vasculature. The anterior cerebral artery was found ruptured on the right side at its junction with anterior communicating artery (Fig 4).

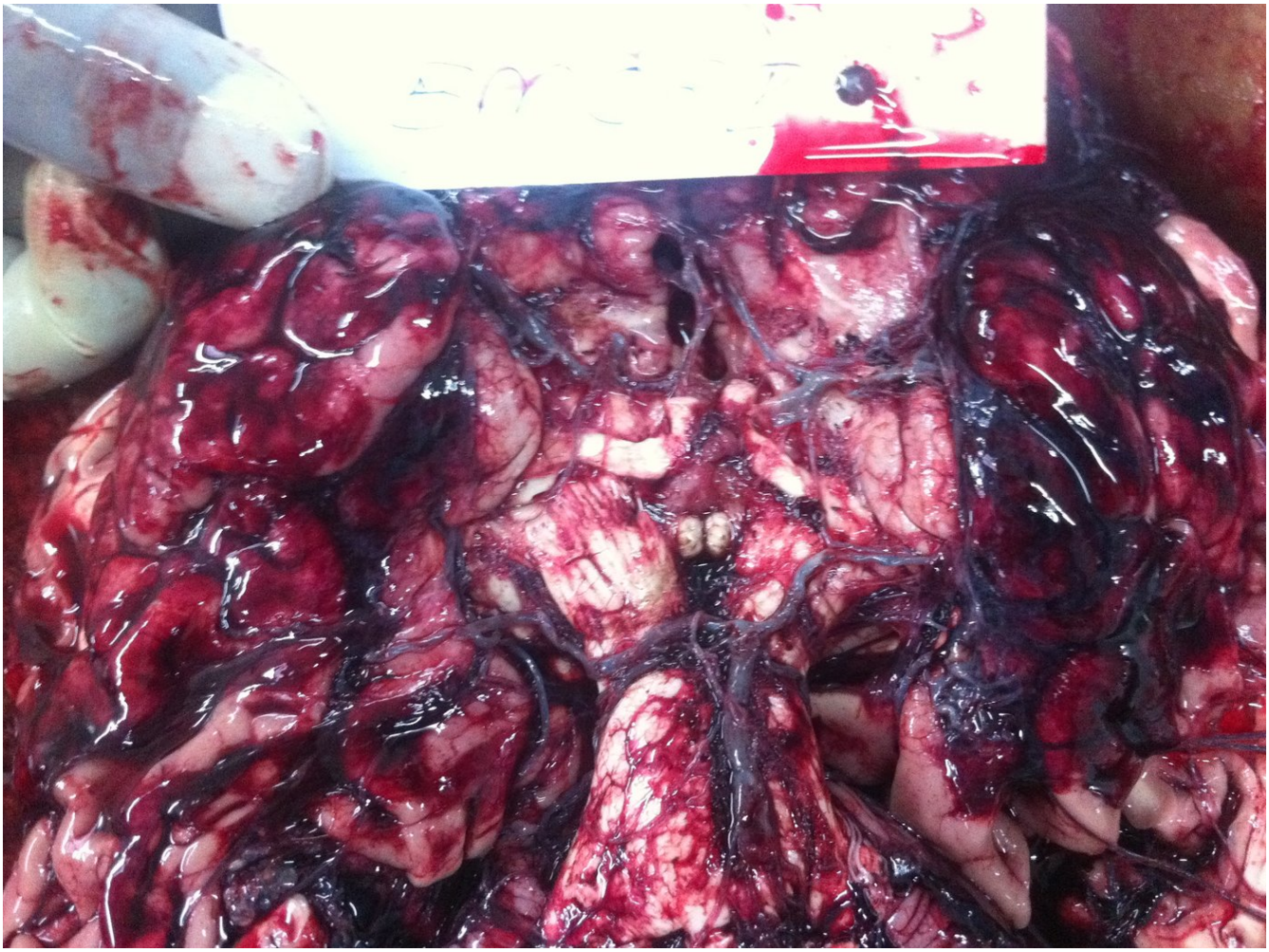


Figure 4 - Rupture of Saccular aneurysm

The cause of death was opined as a result of rupture of cerebral blood vessels.

DISCUSSION

Situs inversus (also called situs transversus or oppositus) is a congenital condition in which the major visceral organs are reversed or mirrored from their normal positions. The normal arrangement is known as situs solitus. In other rare cases, in a condition known as situs ambiguus or heterotaxy, situs cannot be determined[1]. Dextrocardia was first seen and drawn by Leonardo da Vinci in 1452–1519. However, situs inversus was first described more than a century later by Matthew Baillie. The prevalence of situs inversus varies among different populations but is less than 1 in 10,000 people. The condition affects all major structures within the thorax and abdomen. Generally, the organs are simply transposed through the sagittal plane. The heart is located on the right side of the thorax, the stomach and spleen on the right side of the abdomen and the liver and gall bladder on the left side. The left lung is trilobed and the right lung bilobed, and blood vessels, nerves, lymphatics and the intestines are also transposed[1].

The most frequent cause of clinically significant subarachnoid hemorrhage is rupture of a *saccular (berry) aneurysm.* Hemorrhage into the subarachnoid space may also result from vascular malformation, trauma (in which case it is usually associated with other signs of the injury), rupture of an intracerebral hemorrhage into the ventricular system, hematologic disturbances, and tumors. Rupture can occur at any time, but in about one-third of cases it is associated with acute increases

in intracranial pressure, such as with straining at stool or sexual orgasm[2]. Blood under arterial pressure is forced into the subarachnoid space, and individuals are stricken with sudden, excruciating headache (classically described as "the worst headache I've ever had") and rapidly lose consciousness. Between 25% and 50% of individuals die with the first rupture, although those who survive typically improve and recover consciousness in minutes[2]. Saccular aneurysms occur at the bifurcations of the large to medium-sized intracranial arteries; rupture is into the subarachnoid space in the basal cisterns and often into the parenchyma of the adjacent brain. Approximately 85% of aneurysms occur in the anterior circulation, mostly on the circle of Willis. About 20% of patients have multiple aneurysms, many at mirror sites bilaterally[3].

Situs inversus totalis with dextrocardia was detected incidentally in a 60-year-old cadaver in routine dissection kept for undergraduate medical students by D Radhika et al[4]. Congenital diaphragmatic hernia is associated with situs inversus totalis as given by CD Tesselaar et al[5]. Combination of meckel's diverticulum with situs inversus totalis has been reported by V Yazhini et al[6].

CONCLUSION

To conclude, in the present case, the person dint had any previous medical illness prior to his death except for the excruciating head ache which was experienced by him prior to his death. Situs inversus totalis usually does not cause any significant morbidity to an individual harbouring it. However, its timely diagnosis is crucial for the correct interpretation of future symptoms and results of diagnostic procedures. An antedated diagnosis of this disorder will form a baseline reference for future procedures and as such will be invaluable in preventing an unintentional mishap.

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