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# Case Report:
# The Silent Sentinel: A Forensic Case Report of Sudden Death Due to Spontaneous Rupture of an Extracranial Carotid Artery Aneurysm

**1 Anjesh Mittal**,2 Richa Gupta,3 Umer Bin Abdul Aziz,4 Ajay Singh,5 Pradip K. Pal

**Affiliations:**

1. Senior Resident, Department of Forensic Medicine & Toxicology, Autonomous State Medical College, Firozabad, India.
2. Professor and Head, Department of Forensic Medicine & Toxicology, Sarojini Naidu Medical College, Agra, India.
3. Professor & Head, Department of Forensic Medicine & Toxicology, Autonomous State Medical College, Firozabad, India.
4. Junior Resident, Department of Forensic Medicine & Toxicology, Sarojini Naidu Medical College, Agra, India.
5. Junior Resident, Department of Forensic Medicine & Toxicology, Autonomous State Medical College, Firozabad, India.

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**Correspondence:**

**Dr. Anjesh Mittal**
**Senior Resident,** Department of Forensic Medicine & Toxicology, Autonomous State Medical College, Firozabad, India,
Email- dranjeshmittal@gmail.com

**Abstract**

**Introduction:** Extracranial carotid artery aneurysms (ECAAs) constitute a rare vascular pathology, accounting for <1% of all arterial aneurysms. Their clinical presentation is often asymptomatic, and spontaneous rupture is an exceptionally rare, frequently fatal event that can mimic suspicious death.

**Case Presentation:** We report the case of a 62-year-old hypertensive male with chronic alcoholism, discovered deceased in a locked hotel room. External examination revealed no signs of trauma. A comprehensive forensic autopsy identified approximately 500 ml of hemothorax, left ventricular hypertrophy, and micronodular cirrhosis. Critical findings included a ruptured saccular aneurysm (2.5 x 2 cm) of the left common carotid artery. Histopathological examination confirmed atherosclerotic degeneration of the vessel wall. The cause of death was established as hemorrhagic shock secondary to spontaneous ECAA rupture.

**Discussion:** This case underscores the medicolegal significance of ECAAs as a cause of sudden unexpected death. The primary etiologies—atherosclerosis and hypertension—were present in this individual, with chronic alcoholism potentially exacerbating vascular fragility. The absence of premonitory symptoms aligns with the documented silent progression of most ECAAs. A review of literature confirms the extreme rarity of spontaneous rupture but affirms its catastrophic potential. The autopsy served a critical dual purpose: elucidating a natural cause of death and excluding foul play, which was initially suspected due to the circumstances of discovery.

**Conclusion:** Spontaneous rupture of an ECAA, while rare, must be considered in the differential diagnosis of sudden unexplained death, particularly with findings of cervical or thoracic hemorrhage. This report highlights the indispensable role of meticulous forensic autopsy in distinguishing natural vascular catastrophes from unnatural deaths, thereby contributing to both medical knowledge and judicial clarity.

**Keywords:** Carotid Artery Aneurysm; Extracranial; Sudden Cardiac Death; Forensic Pathology; Autopsy; Hypertension; Atherosclerosis

**Introduction:** An arterial aneurysm is defined as a permanent, localized dilation exceeding 50% of the vessel's normal diameter, resulting from structural weakness of the wall. While aortic, iliac, and femoral sites are most frequent, aneurysms involving the extracranial carotid artery are exceedingly uncommon, representing approximately 0.8-1% of all peripheral aneurysms (El-Sabrout & Cooley, 2000). Etiologies are diverse, including atherosclerosis, trauma, dissection, infection (mycotic), and connective tissue disorders; in adults, degenerative atherosclerosis is the predominant cause (Kakisis et al., 2014).

ECAAs are frequently clinically silent or present with nonspecific symptoms such as a pulsatile neck mass, dysphagia, hoarseness from cranial nerve compression, or transient ischemic attacks from thromboembolism. However, spontaneous rupture without antecedent trauma or infection is a scarcely documented, lethal complication, often leading to rapid exsanguination and sudden death (Wandschneider et al., 1996). The forensic importance of this entity lies in its potential to cause unexpected demise in individuals often with known comorbidities, sometimes under circumstances that initially arouse suspicion of homicide or suicide. This report details a medicolegally pertinent case of fatal ECAA rupture, emphasizing the critical role of systematic postmortem examination.

**Case Report:** A 62-year-old male was discovered unconscious in a hotel room locked from the inside, prompting police investigation and an inquest for suspected unnatural death. He was transported to a tertiary care facility but was declared dead on arrival. History obtained from relatives indicated a three-decade history of chronic alcoholism (250-300 ml of country liquor daily) and poorly controlled hypertension of 10 years' duration, with irregular adherence to medication. There was no history of recent trauma, surgical intervention, or diabetes.

**Autopsy Findings**

The body of a moderately built, nourished male exhibited generalized pallor and established rigor mortis. No external injuries were noted. Internal examination revealed approximately 500 ml of fluid

and clotted blood within the left thoracic cavity. The heart (450g) demonstrated concentric left ventricular hypertrophy. The liver was firm, shrunken, and diffusely nodular, consistent with micronodular cirrhosis.

A meticulous layered dissection of the neck exposed a dilated, atherosclerotic segment of the left common carotid artery, measuring 2.5 x 2.0 cm. A 1.0 cm transverse rent was identified on its anterolateral aspect, surrounded by organizing hematoma (Figure 1). No evidence of blunt or penetrating trauma was present in adjacent structures. Histopathological analysis of the aneurysm wall showed fragmentation of the elastica lamina, medial thinning, and atheromatous plaque deposition (Figure 2). Sections of the liver confirmed alcoholic cirrhosis (Figure 3). Other organs exhibited nonspecific congestion.

**Cause of Death**

The cause of death was certified as hemorrhagic shock due to rupture of an atherosclerotic extracranial carotid artery aneurysm. The manner of death was determined to be natural. The autopsy findings conclusively ruled out external injury or foul play.

**Discussion:** This case exemplifies the quintessential forensic challenge posed by silent ECAAs that declare themselves catastrophically. The demographic and risk profile of our patient—an elderly male with longstanding hypertension and atherosclerosis—mirrors the predominant etiology cited in the literature (El-Sabrout & Cooley, 2000). Chronic alcoholism, via its association with hypertension and potential direct vascular toxicity, likely served as a contributory factor. The extreme rarity of spontaneous ECAA rupture is well-established. Large clinical series focus almost exclusively on elective repair for symptoms like embolization or mass effect (Welleweerd et al., 2015; Radak et al., 2014). Rupture is seldom encountered in living patients, making autopsy reports like this one crucial for understanding its natural history. As noted by de Souza et al. (2021) in their comprehensive review, ruptured ECAAs (rECAAs) are life-threatening events with high mortality, often reported as isolated case studies.

The clinical silence of the aneurysm in this case is a

critical point. Unlike patients in surgical series who present with palpable masses or neurologic symptoms (Chen et al., 2019; Ni et al., 2018), our patient had no reported antecedent complaints. This underscores a key dichotomy in ECAA disease: while the surgical literature appropriately focuses on preventing stroke (Kakisis et al., 2014), the forensic literature must account for the subset where the first and final presentation is fatal hemorrhage.

From a medicolegal perspective, this case highlights a critical axiom: circumstances surrounding discovery are not always indicative of the manner of death. The locked room scenario initially suggested suicide or concealed homicide. The autopsy, by providing definitive anatomical evidence of a natural disease process capable of causing rapid death, served its paramount function of delivering objective evidence to the judicial system. It transitioned the case from one of suspicion to one of documented medical fatality.

**Conclusion:** Spontaneous rupture of an extracranial carotid artery aneurysm remains a rare but potent cause of sudden unexpected death. This report reinforces several key principles:

1. **Clinical Vigilance:** In high-risk patients (hypertensive, atherosclerotic), even vague cervical symptoms warrant consideration of vascular pathology.
2. **Forensic Imperative:** A meticulous, systematic autopsy is non-negotiable in cases of unexplained sudden death, particularly where circumstances are ambiguous. Comprehensive dissection of the neck and great vessels is essential.
3. **Medicolegal Resolution:** Pathological findings provide definitive evidence to distinguish between natural and unnatural death, ensuring accurate legal adjudication.

This case contributes to the sparse literature on fatal ECAA rupture and reiterates the indispensable role of forensic pathology in bridging clinical medicine and the law.

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Figure 1. Large vessels and Heart

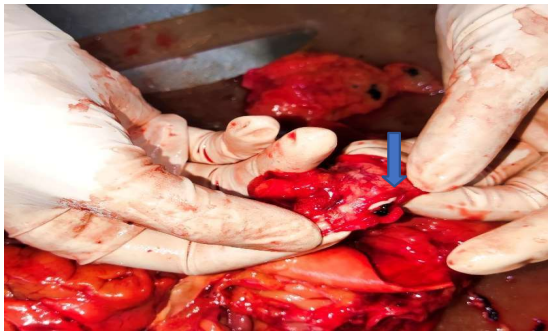

Figure 2: Carotid Aneurysm

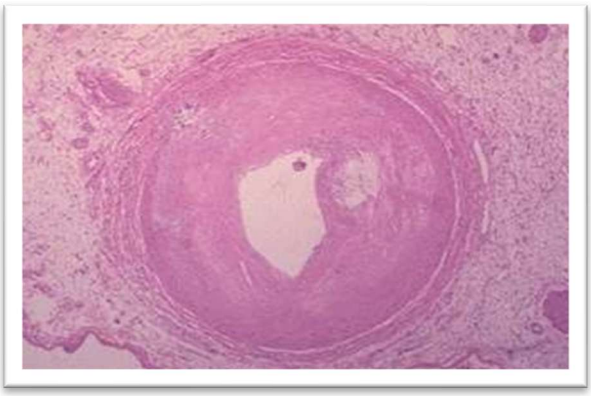

Figure 3: Histological Section of carotid aneurysm

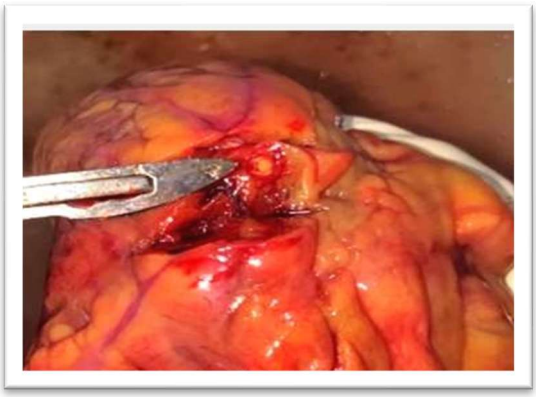

Figure 4: Dissection showing congestion

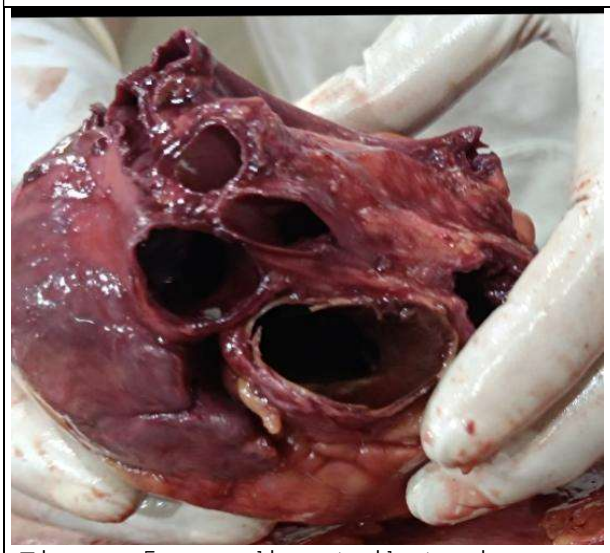

Figure 5: cardiac tributaries dissection

Figure 6 : shows Histology of cirrhotic liver