

## A Rare Case of Foreign Accent Syndrome Secondary to Cardiac Arrest

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### ABSTRACT

Foreign Accent Syndrome (FAS) is a rare and poorly understood condition in which a patient develops a change in intonation resulting in a new foreign accent. FAS is associated with a traumatic event, especially neurologic injury. The literature suggests FAS is commonly associated with cerebrovascular accidents, though other precipitating neurological conditions are documented. To our knowledge, there is no reported case of FAS associated with cardiac arrest. Here we report a case in which a patient local to Louisiana developed a change in speech resembling a Haitian accent secondary to cardiac arrest.

### Keywords:

Cardiology, Foreign Accent Syndrome (FAS), Critical care, Cardiac arrest

### Introduction

Foreign Accent Syndrome (FAS) is an exceedingly rare condition with only about 60 cases recorded in the literature [1]. FAS is characterized by patients developing a new form of speech resembling a foreign accent following a traumatic event. Most documented cases have been associated with strokes but FAS has also been reported secondary to seizures, brain metastases, traumatic brain injury, and even multiple sclerosis [2-4]. The following case describes a patient who developed FAS secondary to a cardiac arrest from which she recovered but was left with changes in her speech resembling a foreign accent.

### Objectives

- Discuss the pathophysiology of Foreign Accent Syndrome (FAS), an exceedingly rare but real pathology thought to be secondary to brain ischemia
- Highlight the medical history of a patient who developed FAS secondary to a cardiac arrest
- Summarize the existing evidence on how FAS is thought to develop

### Case Report

A 53-year-old female with New York Heart Association Class 4 heart failure was initially admitted for acute decompensation of chronic heart failure with reduced ejection fraction and cardiogenic shock. Transthoracic Echocardiogram (TTE) revealed severe Right Ventricular/Left Ventricular (RV/LV) dysfunction and Automatic Implantable Cardioverter-Defibrillator (AICD) interrogation showed frequent tachyarrhythmias. She was started on vasopressor therapy and diuretics and was eventually stepped down to the floor from the cardiac Intensive Care Unit (ICU). The patient has had numerous admissions over the years for decompensated heart failure secondary to nonischemic

cardiomyopathy.

On interview, the patient reported suffering a cardiac arrest 10 years ago and reported an almost full recovery to her baseline except for a change in her accent. When asked to clarify this, she mentioned that the way she spoke now was completely different from the way she used to speak prior to the cardiac arrest. The patient had grown up locally in southeastern Louisiana and had spent her whole life in the area, but after her cardiac event her intonation changed. The patient's speech pattern now resembled a Haitian accent despite never having spent time abroad or having family members with similar accents. The patient herself was well-versed in the evidence on foreign accent syndrome and previous evaluations revealed no neurological or psychiatric pathology that could explain the patient's symptoms following her arrest.

Further review of the patient's medical records showed that she had a history of nonischemic cardiomyopathy, severe heart failure with reduced ejection fraction, and atrial fibrillation when the cardiac arrest happened. At the time, she was enrolled in a trial to optimize her heart failure therapy and this included a procedure to insert a left atrial pressure monitoring device into her heart. During the procedure over ten years ago, the patient suffered a surgical complication and rapidly developed cardiac tamponade. The patient went into cardiac arrest but was successfully resuscitated and intubated. Over the ensuing weeks, the patient was gradually able to make an almost full recovery. At the time of the patient's discharge to inpatient rehab, she still had occasional memory deficits and was alert and oriented to name and location but not to date (Table 1).

All of the patient's previous records were reviewed and she was documented to have slowly regained her speech and memory following the cardiac arrest. An Electroencephalogram (EEG) performed after the event showed normal brain activity making Cerebrovascular Accident (CVA) a less likely cause for the patient's symptoms. A brain Magnetic Resonance Imaging (MRI) was not performed following the arrest but given the

**Figure 1:** Foreign Accent Syndrome (FAS) common features.

| Documented Causes      | Cerebrovascular Attack   | Migraines                            | Head Trauma                          |
|------------------------|--------------------------|--------------------------------------|--------------------------------------|
| Common Speech Symptoms | Changes in Pronunciation | Changes in Intonation                | Changes in Speech Rhythm and Pattern |
| Diagnostic Tools       | MRI Brain                | Speech Language Pathology evaluation | Formal Neurology Evaluation          |
| Treatments             | Speech Therapy           | Treatment of Underlying Cause        |                                      |

patient’s history of atrial fibrillation and AICD placement, it is possible that this may have been deferred. Given the timeframe of the patient’s cardiac arrest, it is possible that some records were not uploaded into the electronic medical record but more recent hospitalization records also did not show any evidence of new brain imaging. It is possible that the patient’s gradual recovery, sedation requirements during intubation, and medication for pain control following her cardiac arrest did not make it obvious that the patient’s accent had changed at the time, and could also have been overlooked due to the relative rapidity with which she regained her other motor, sensory, and cranial nerve functions. Given the patient’s history of severe heart failure and atrial fibrillation, it is possible that the patient embolized a clot during cardiopulmonary resuscitation and suffered an ischemic neurological event during the arrest.

### Discussion

One of the first cases of FAS was documented by the Norwegian neurologist Monrad-Krohn in 1941 of a patient who was struck by shrapnel during an air raid in World War II. The patient gradually recovered from a traumatic brain injury to the left side of her head but was left with a different pattern of speech resembling a foreign accent. Subsequent case reports have mentioned a variety of accent changes ranging from British to French, American to British, Japanese to Korean, and even Spanish to Hungarian [5].

Although no specific lesion in the brain has been found that explains FAS, many patients experience damage to regions associated with language [6]. Damage to the left basal ganglia has been associated with FAS in one case, while other reports mention the precentral gyrus, inferior central gyrus, insula, and corpus collosum [6-8]. An alternate theory is that FAS is secondary to an increase in left brain activity in the ventral angular gyrus or the central sulcus [9].

Upon closer inspection, patients with FAS do not actually demonstrate changes in their accent but rather a change in their intonation, pauses in speech, and alterations in vocal stress [2]. Studies by linguists of FAS patients have almost universally shown that patients do not develop a precise foreign accent but differences in pronunciation of vowels and syllables [10]. While only one documented case of FAS has been reversible, most patients retain their new pattern of speech for the rest of their lives [1].

### Conclusion

As discussed above, Foreign Accent Syndrome (FAS) is an exceedingly rare condition that occurs following some form of traumatic event. FAS has been shown to be quite distressing at times to the patients and their family members who experience

this condition, and currently, there is no form of therapy or treatment that seems to help revert the patients accent back to their baseline prior to the insulting incident. This can have many implications on a biopsychosocial level. More attention is needed in the future to help further understand the pathophysiology and possibly help find a cure for this condition.

Within this case report, we were able to demonstrate a case of FAS for a middle aged woman who had underwent a major cardiac event in the past and subsequently developed FAS and maintained this condition for the ten years that had passed since the incident.

### Conflicts of Interest

The authors have no conflicts of interest to report.

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No.

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