

## BEAUTY PARLOR SYNDROME: RARE, BUT REAL EMERGING THREAT TO FEMININE NATURE

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### ABSTRACT

Beauty parlor syndrome is the term used to characterize a stroke triggered by hair washing in a hairdressing parlor. It is a clinicopathological disease associated with an infarction within the vertebrobasilar arterial system with complex symptomatology. Post-circulation strokes account for about 20-25 percent of all ischemic strokes and remain a major cause of disability and mortality in patients. Diagnosis can be challenging, partly due to substantial overlap in anterior circulation symptoms and signs with ischemia. For this reason, early detection of symptoms and causes of ischemia in the posterior circulation is essential to choose the most appropriate therapy. To help preserve patients' quality of life and reduce healthcare costs related to this condition, clinicians need to accurately diagnose the condition and appropriately manage patients through the long course of their illness. The aim of this narrative review is to focus on the etiology, pathogenesis, and natural history of PBS for adequate patient management and therapeutic interventions. This review seeks to raise awareness of this rare form of syndrome so that individuals with beauty parlor syndrome are identified and provided with appropriate care.

**KEYWORDS:** Beauty parlor syndrome, vertebrobasilar insufficiency, Stroke.

### 1. INTRODUCTION

"Beauty Parlour Syndrome" refers to a transitory set of neurological symptoms due to reduced blood flow to the posterior circulation of the brain in the vertebral and basilar arteries. The basilar artery is a vitally essential vessel that contributes to post-cerebral circulation. It is formed by the convergence of double vertebral arteries at the junction of the Pons and medulla. The vertebral arteries join the basilar artery to form the vertebrobasilar network that supplies blood to the subsequent portion of Willis' circle. The posterior circulation supplies the medulla, cerebellum, pons, midbrain, thalamus and occipital cortex with blood that is responsible for vision. Therefore, The symptoms attributed to Beauty Parlour syndrome also differ according to which parts of the brain undergo substantially diminished blood supply. Posterior circulation strokes account for approximately 20% of all strokes, with high mortality and morbidity.<sup>[1]</sup> In the U.S., 25 percent of strokes and transient ischemic attacks occur in the basilar vertebra distribution.<sup>[2]</sup>

### 2. Alternative Names \ Synonyms

Beauty Parlour Stroke syndrome, Saloon Wash-basin Syndrome, Global Cerebral Ischemia, Vertebrobasilar Circulatory Disorder, Vertebral Basilar Ischemia, Vertebro-basilar Insufficiency, vertebra-basilar atherosclerotic disease, Basilar artery occlusion, Saloon Sink Syndrome.

### 3. Background

Beauty Parlour Syndrome, medically referred to as vertebrobasilar insufficiency(VBI), is the term used to characterize a stroke triggered by hair washing in a hairdressing parlor. In 1993, Dr. Michael Weintraub introduced Beauty Parlour Syndrome in the Journal of the American Medical Association after witnessing five women who developed extreme neurological symptoms following sustained distortion of their necks from sitting at salon washbasins.<sup>[3]</sup> In 1997, a 42-year-old woman had a stroke when she had her hair washed at a salon, according to a report by British doctors published in the medical journal The Lancet. Two British doctors stated in the report that the stroke was due to damage to the right internal carotid artery, which left her with numbness and slurred speech.

Recent studies of the causes of strokes have found how salon wash basins apply stress to the neck, causing carotid or vertebral arteries to tear.<sup>[4]</sup> Data contributed by clinical studies and neuro imaging over the past two decades has revolutionized our understanding of the clinical aspects, mechanisms, causes, treatments, and post-circulation ischemia prognosis.

#### 4. Etiology

The cause may arise from thromboembolism, atherosclerosis, or vascular dissection. The mechanism differs according to the segment affected.<sup>[5]</sup> Some risk factors predispose BPS patients, especially those which exacerbate atherosclerosis. These risk factors include smoking, genetics, hypertension, age, gender, family history, and hyperlipidemia.<sup>[6]</sup> There is also an increased risk for patients with a history of coronary artery disease or peripheral artery disease. BPS is typically due to chronic atherosclerotic plaque. Furthermore, mechanical forces acting on the neck can lead to unilateral or bilateral BPS. External forces such as leaning one's head back into a washbasin at a beauty salon, chiropractic adjustments, bird watching, bow hunting, or stargazing can result in BPS. Other etiological causes may include cardiovascular conditions such as atrial fibrillation, infectious endocarditis, dissection of the vertebral artery, and systemic hypercoagulable states.<sup>[7]</sup>

#### 5. Epidemiology

About one fifth of strokes and TIAs occur in the vertebrobasilar distribution. 20% of cerebral blood flow passes through the posterior circulation (vertebrobasilar system); it is reasonable to understand why posterior circulation Occlusions represent one fifth of all strokes. Fortunately, basilar artery occlusions are believed to account for approximately only 1% of all strokes.<sup>[8]</sup> There is an increased prevalence in males, with a ratio of 2:1. Owing to several causes, including genetics, higher incidence of obesity, and disparities in health care delivery, African Americans are more prevalent than other racial groups.<sup>[9]</sup>

#### 6. Risk Factors<sup>[10,11]</sup>

Risk factors are similar to those known general stroke risk factors. Risk factors for Beauty parlor syndrome are similar to those which increase the risk of atherosclerosis, including,

- Male gender,
- Genetics,
- Smoking,
- Hypertension,
- Diabetes mellitus
- Hyperlipidaemia.
- Advanced age
- Hypertension
- Obesity
- High-cholesterol levels
- Inactive lifestyle (sedentary)

Patients with a known history of other cardiovascular diseases such as coronary artery disease, atrial fibrillation, endocarditis, arterial dissections or hypercoagulable states are also at risk for VBI.

#### 7. Clinical Presentation<sup>[5,12,13]</sup>

Because of decreased blood flow, and since vertebrobasilar disease affects numerous separate brain structures, symptoms are varied and sometimes mentioned as vertebrobasilar insufficiency (VBI) or basilar vertebral ischemia (lack of blood flow to an organ). Symptoms of BPS are the outcome of ischemia supplied by the posterior circulation in the various parts of the brain.

#### Symptoms include

- Vertigo (the most common symptom)
- Dizziness/syncope: Sixty percent of patients with VBI have at least 1 episode of dizziness.
- "Drop attacks:" Patient feels suddenly weak in the knees and fall
- Diplopia/Loss of vision
- Paresthesia
- Confusion
- Dysphagia/dysarthria
- Headache
- Altered consciousness
- Ataxia
- contralateral motor weakness
- Loss of temperature and pain
- Incontinence

Vertigo is a common symptom in VBI. It is also a central symptom of peripheral vestibular disorders, which are more benign. The hallmark symptoms manifest in the majority of patients are an abnormal level of consciousness and focal motor weakness. In more than 40 percent of patients, pupillary abnormalities, oculomotor signs, and pseudobulbar manifestations (facial palsy, dysphonia, dysarthria, dysphagia) are seen. VBI is a specific type of transient ischemic attack and thus must resolve within 24 hours by definition; however, VBI symptoms usually only last a few seconds to an hour.

#### 8. Pathophysiology

As with other types of strokes, and infarction can occur from an embolism. Usually, VBI is caused by two processes of ischemia: hemodynamic insufficiency and embolism (Figure 1). Unlike the carotid arteries, embolism is not common via vertebral arteries. Donor embolism sites may include the aortic arch, vertebral artery origin, or proximal subclavian arteries. However, most cases stem from atherosclerotic disease.

##### 8.1 Embolism

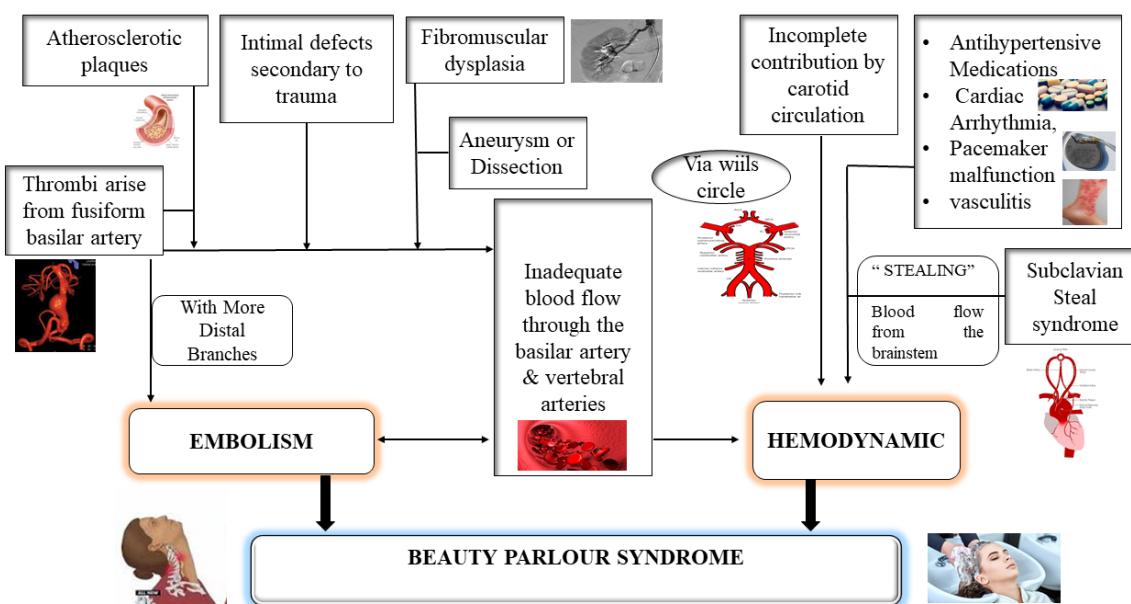
A thrombus that arises in the heart travels more frequently to the anterior circulation than to the posterior circulation system. VBI may come from atherosclerotic

plaques, which later break off to form emboli.<sup>[14]</sup> Emboli may also develop as a result of intimate defects to secondary to trauma, compression, and in a minority of cases from fibromuscular dysplasia, aneurysm or dissection. These may cause Atrial fibrillation, which is the most common cause of embolic infarction.<sup>[15-17]</sup>

## 8.2 Hemodynamic

Hemodynamic insufficiency can lead to reduced blood flow through the basilar artery or both vertebral arteries resulting in VBI.<sup>[18]</sup> Symptoms tend to be reproducible

and short, with rare infarction. Hemodynamic ischemia is significant to occur occlusion in both vertebral arteries or within the basilar artery. Also, there will be an incomplete contribution by the carotid circulation via the posterior communicating artery in the circle of Willis. Also risk factors for VBI include antihypertensives, pacemaker malfunction and vasculitis. Occlusions in other blood vessels such as Subclavian Steal syndrome can also induce VBI by "stealing" blood flow from the brainstem as blood flows down the least resistant route through the vertebral artery.<sup>[19]</sup>



**Figure 1: Pathophysiology of Beauty Parlor Syndrome.**

## 9. Evaluation

The evaluation of vertebrobasilar insufficiency commences with a history and physical examination, with particular emphasis on cardiovascular and neurological examinations. The primary objectives of the evaluation are to establish the position of the vascular lesion and to assess whether acute intervention is required in a time-sensitive manner to achieve recanalization.

Laboratory studies have restricted relevance but can involve a complete blood picture, blood urea nitrogen (BUN) and creatinine, lipid profile, international standardized ratio (INR), activated partial thromboplastin time (aPTT) and prothrombin time (PT). Screening for the deficiency of protein C, protein S, or antithrombin III is frequently advocated, but these are more commonly responsible for venous thrombosis than arterial problems. An electrocardiogram helps screen for arrhythmias that may be indicative of a thrombotic etiology.

For diagnosis and management, arteriographical imaging of the vertebral and basilar arteries is crucial. Imaging studies required to diagnose VBI are as follows:

1. Computed tomography (CT): CT scanning is usually the first imaging study performed. CT may be effective in identifying larger ischemic insult areas. The CT is highly sensitive in hemorrhage detection. CT scanning, however, has a low sensitivity for early ischemia and is less effective in assessing brainstem, cerebellum and posterior circulation.
2. CT angiography (CTA): CTA will produce good images of both intracranial and extra-cranial vessels, but ionizing radiation and the use of nephrotoxic contrast media make it less suitable both in elderly people with renal insufficiency and young adults due to exposure to radiation.
3. Magnetic resonance angiography (MRA): MR angiogram can show the site of vascular occlusion non-invasively.
4. Magnetic resonance imaging (MRI): MRI is the best imaging modality for any posterior fossa lesion, including acute ischemic infarction.
5. Intracranial MRA is mostly sufficient to evaluate vertebrobasilar arteries, while extra-cranial vertebral arteries are preferred diagnosed employing contrast-enhanced MRA, which is less dependent on flow phenomena and more accurate in appraising stenosis.

For the diagnosis of early ischemia and vascular occlusion MRI / MRA is more sensitive than CT scanning. Other pathologies, such as brainstem cavernoma or cerebellopontine angle lesions, including acoustic schwannoma and dermoid / epidermoid cysts that can be convincingly identified by MRI. Duplex ultrasound may also be used, despite its limits, for abnormalities within the vertebral artery.<sup>[12,20-23]</sup>

## 10. Differential Diagnosis

It is important to consider other etiologies when evaluating the diagnosis which can cause similar overlapping symptoms. The differential diagnosis for vertebrobasilar insufficiency includes Labyrinthitis, Vestibular neuronitis, Meningitis, basilar migraine, cerebellar hemorrhage with brainstem compression, Benign paroxysmal positional vertigo, cerebellar infarct or hemorrhage with edema, Subsequent fossa lesions including metastatic disease and supratentorial mass lesions with mass effect, herniation, and compression of the brainstem. Consider hypoglycemia, Todd paralysis, and conversion disorder as possible mimics.<sup>[24,25]</sup>

## 11. Management of beauty parlor syndrome

Treatment usually involves lifestyle modifications. Treatment depends reliably on the root causes of the VBI. Some common culprits are postural changes, exercise, and dehydration, and so patients could be advised to avoid such precipitating activities.<sup>[26]</sup> For example, If the Patient is an elderly patient who has suffered a "drop attack" in which he/she has associated head or other injuries, then he/she should be advised to sit down if he/she has light headedness or changes in vision.

Treatment of vertebrobasilar disease requires prompt care, as with ischemic strokes in the anterior circulation. Similar to all types of ischemic events, a multimodality approach is needed for secondary prevention.

Sometimes, Antiplatelets (Aspirin or clopidogrel) and anticoagulation(warfarin) medications are sometimes indicated to prevent events if the cause of the vertebrobasilar insufficiency was hypercoagulability once hemorrhage has been ruled out with neuroimaging.<sup>[27]</sup>

### 11.1 Non-Pharmacological Therapy

Numerous medical, interventional, and surgical options are available for the treatment of ischemia in the brain's posterior circulation.

#### 11.1.1 Lifestyle Modification

The very first step in the non-pharmacological therapy of vertebrobasilar disease is lifestyle modifications,<sup>[28]</sup> including,

- Dietary modifications
- Smoking cessation
- Strict blood sugar control
- Regular exercise

- Diabetes control
- Rehydration

#### 11.1.2 Surgical Options

Surgical options available in vertebro-basilar insufficiency are,

- Endarterectomy
- Bypass grafting
- Vertebral artery reconstruction
- Angioplasty and Stenting

Surgical options are very limited.<sup>[29]</sup> Surgery may be indicated in selected patients, and the possibilities are either to perform an open surgical repair or endovascular repair with more common stent placement via a catheter in the groin.<sup>[30]</sup> The implications are still uncertain for surgery of the vertebral arteries.

Angioplasty is often performed for patients with basilar artery stenosis, but its exact role in vertebral artery stroke remains unclear.<sup>[31]</sup>

## 12. Prognosis

The prognosis following a vertebral artery stroke depends on the severity of the neurological signs, patient age, the presence or absence of arterial lesions, the location and degree of infarction, and other comorbidities. There is also a recurrence risk of 10-15 percent. Even if the stroke is minor, the morbidity is high. Patients who survive often need extensive rehabilitation for several months, and even then, residual neurological deficits may be present.

## 13. Complications of Beauty Parlor syndrome :

The major complications of beauty parlor syndromes are,

- Deep vein thrombosis
- Pulmonary embolism
- MI
- Aspiration pneumonia
- Gastritis
- Pressure sores

## 14. Prevention of Beauty parlor syndrome

The most common cause of vertebrobasilar disease is atherosclerosis, and it can be prevented by following guidelines,

- Don't smoke
- Eat foods low in fat and cholesterol
- Lose weight if you are overweight
- Exercise regularly
- Lower your blood pressure if it is high
- Lower your blood sugar if it is high
- Use head bed (head-neck cushion)

## 15. CONCLUSION

Beauty parlor syndrome (Vertebral-basilar insufficiency) occurs when the neck is overstretched to a sink during hair washing, damaging the neck's blood vessels and disrupting blood circulation. As a result of reduced blood

flow leading to a grave condition of stroke. Head Bed is an ingenious head-neck mattress with an adjustable head support pad and additional support mattress, by supporting a client's head at its highest level, the occipital bone, it reduces undue pressure on the neck. This allows the muscles at the neck to relax completely. There is no actual supporting research yet, but cases have been published in medical journals. Although there is not yet a proven link, there is anecdotal evidence, and more emphasis should be given to welcome the research into this area.

### Conflict Of Interest

We declare that we have no conflict of interest.

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