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Letter to the Editor

PARRY-ROMBERG SYNDROME – AN UPDATE

R. Borgia

Lecturer, Dental School, Albanian University, Tirana, Albania

Correspondence to:
Raffaele Borgia, DMD
Albanian University, Tirana, Albania
e-mail: raffaele.borgia@yahoo.it

ABSTRACT

An uncommon condition known as Parry Romberg Syndrome (PRS) or Progressive Hemifacial Atrophy typically affects one side of the face and results in the loss of both soft and hard tissues. The illness occurs quickly. Aesthetic and functional losses brought on by the breakdown of soft and hard tissue are exacerbated by the existence of concomitant illnesses such as neuralgia, migraine, epilepsy, and ocular involvement. The age which the disease initially reveals itself determines the severity of the malformation. The severity of the malformation increases with age. Significant psychological stress and social issues are experienced by these patients. The specific cause is unknown, and the majority of the treatment is cosmetic.

KEYWORDS: *Parry-Romberg Syndrome, PRS, Progressive Hemifacial Atrophy*

INTRODUCTION

An uncommon condition known as Parry-Romberg syndrome (PRS) causes atrophy of the skin, subcutaneous fat, muscles, and, in very rare cases, bone structures. Women are more likely to have it. Usually, just one side of the face is involved. It is uncommon for the body to be involved ipsilaterally, and 20% of cases are bilateral. Even though certain cases of PRS have been reported with a late onset, the condition often manifests in the first ten years of life. Over a period of two to twenty years, it gradually advances before stabilising (1).

The atrophic skin could look glossy and hyperpigmented. Linear scleroderma “en coup de sabre” (“strike of the sword”) is a condition in which certain patients have a linear, scar-like depression close to the centre of the forehead. Muscle atrophy, hypoplasia of the underlying bone, and fat loss may cause the face to appear caved in as the condition worsens. Enophthalmos frequently occurs from orbital involvement. Alopecia, epilepsy, facial paresthesia, and trigeminal neuralgia are some more possible side effects. The tongue may have unilateral atrophy intraorally. The maxillary teeth may become visible due to upper lip atrophy. An open bite, inadequate root development, or root resorption may be visible

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in teeth on the affected side. Over the course of two to twenty years, progressive hemifacial atrophy gradually worsens until stabilising. Methotrexate, which is frequently coupled with systemic corticosteroids, can be used to treat active disease. The cosmetic defect may be improved with plastic surgery. Additionally, orthodontic treatment is frequently required to correct any underlying malocclusions (2).

Epidemiology

Considering a male-to-female ratio of one to three, the incidence of PRS ranges from 0.3 to 2.5 per 100,000 people each year. Excluding a few cases in the geriatric age range, PRS often begins in the first two decades of life. The average age of onset is 13.2 years, with males being more likely to receive a diagnosis earlier. The illness progresses, then "burns out" after 2 to 20 years and goes into spontaneous remission. Up to 35% of patients have ophthalmic involvement. 15% to 20% of people get neurological symptoms (3).

Biology and pathology

Numerous hypotheses have been put out regarding the cause of hemifacial atrophy, including those involving genetics, trigeminal neuritis, trauma, endocrine issues, viral infection, autoimmune, sympathetic dysfunction, and a connection to a connective tissue illness, particularly scleroderma. (4)

It is still unclear what exactly causes Parry-Romberg syndrome (PRS). This unusual degenerative disease has no known genetic tendency. Romberg's original theory was that atrophic vasomotor neuritis is what causes the illness. However, up to a third of those who are impacted have a history of trauma or surgery. With varying degrees of success, studies have also examined the function of autoantibodies or autoimmune infectious agents. A key factor that has also been hypothesised is a brain abnormality that affects fat metabolism. However, none of the hypotheses hold up to careful examination, and the root cause of hemifacial atrophy is still unknown.

PRS frequently coexists with problems of the nervous system, the heart, the eyes, the joints, the endocrine system, the maxillofacial region, and the teeth. The most frequent association is neurological, which includes migraine, hemiplegia, brain atrophy, and intracranial vascular abnormalities. Because of this, some writers classify the PRS as a "neuro-cutaneous syndrome" (1).

Possible theories to explain biology of PRS

There is ongoing discussion on the exact etiopathogenesis. The following are the theories that are most widely accepted (3):

The "trophoneurosis" theory: The initial theories involved trophic fibre malfunction in the trigeminal and other peripheral nerves. This notion is supported by reports of trigeminal neuralgia and chronic face pain. Confocal microscopy evidence supports this notion by demonstrating a decrease in corneal nerve endings, which are supplied by the ophthalmic division of the trigeminal nerve.

Immune-mediated mechanism: The commonly accepted opinion is that PRS is an autoimmune illness. There has been a lot of overlap with the condition known as linear morphea, a type of systemic sclerosis. In a small number of cases, it has been reported that autoimmune conditions such systemic lupus erythematosus, rheumatoid arthritis, inflammatory bowel disease, ankylosing spondylitis, vitiligo, and thyroid abnormalities also exist. Anti-nuclear antibodies offer a clear-cut serological foundation.

Sympathetic dysfunction: Similar to PRS, swelling or dysfunction of the "superior cervical sympathetic plexus" results in enophthalmos, ipsilateral face atrophy, and bone atrophy. Ipsilateral sympathectomy demonstrates a reversal of the disease's course.

Neuro-vasculitis theory: The cerebral lesions' histology shows lymphocytic vasculitis, which resembles Rasmussen encephalitis. Aneurysms and other cerebrovascular abnormalities that are occasionally seen in PRS patients are explained by interstitial neurovasculitis comprising the main arteries. Along the trigeminal nerve's fibers, similar lesions are documented.

Neural crest cell disorder: The existence of soft tissue cancers, cerebral vascular abnormalities, and aneurysms raises the possibility that neural crest cell migration is dysregulated.

Hereditary mechanism: In some cases, PRS is a hereditarily degenerative disorder, however there have only been a

few familial cases reported thus far. No particular gene or inheritance pattern has been discovered, up today.

Trauma-related: Online polls of PRS patients have revealed a contentious link between a brain injury inflicted during infancy and the development of symptoms.

Infectious causes: Risk factors include prior infections with the borrelia burgdorferi, herpes simplex, and varicella zoster viruses.

Pathogenesis and clinical course

Pathogenesis of PRS is not clear (5). The study suggested the possible neurotrophic pathogenesis of PRS since the underlying mechanism of PRS follow the same pattern and pathways of "trigeminal nerve innervation". Some studies also reported the PRS disorder was supposed to be familial one. The anatomical changes resulting from PRS also have a considerable impact on the possible growth potential of hard tissues. These changes halt the increase in the size throughout the growth phase. Those soft tissues who are linked with this also undergo shrinkage process due to adipose tissue loss. This is the reason that facial atrophy which used to happen during second life decade is comparatively less observed because till that time, the facial bone also truly developed. Early onset of PRS and a longer duration result is observable facial deformity.

Most often, the onset PRS happen during the first as well as second decade of life. Women are reported to be affected more than men. Most often PRS has an impact on the left side of face. The characteristics study of PRS showed that this disease develops throughout many years and after a point, it become stable. The condition can also "burn" itself when it is at its starting phase. This will result in somehow minimal facial deformity. Changes regarding the deformity, involved processes and PRS duration can be stabilized during growth. The further extension of facial atrophy is limited since one side of face affected. Also, the involvement of patient's body is ipsilateral.

Clinical findings show that darkly pigmented skin can become dry. Some patients have a line separating their normal skin from their abnormal skin, resembling a large linear scar called a "coup de sabre," as seen in this instance. Enophthalmy, caused by fat loss around the orbit, is perhaps the most frequent symptom of ocular involvement and has been seen. The eye typically functions normally. Localized alopecia may exist. There might occasionally be some neurological side effects such trigeminal neuralgia, facial paresthesia, excruciating headaches, and contralateral epilepsy (4).

Treatment and management

Despite the fact that there is no treatment for this condition, numerous efforts have been made to both halt its progression and rectify any leftover defects. There have been no recorded clinical trials, and it is very difficult to anticipate how a patient will respond to treatment. As a self-limiting condition, Parry Romberg Syndrome calls for medical attention only when it coexists with other autoimmune diseases like scleroderma. In severe and progressing cases of PRS, immunosuppressants like cyclophosphamide, methotrexate, corticosteroids, and azathioprine have been utilised. The standard treatment for active illness is methotrexate (3). The highest weekly dose of methotrexate in oral or injectable form is 25 mg, and the dose varies from 0.3 to 1 mg/kg/week. It is frequently taken in combination with oral prednisolone, 1 mg/kg/day reduced at the conclusion of three months. Surgery to address any remaining deformities constitutes the primary type of treatment for Parry Romberg syndrome. To get a long-lasting outcome, it requires repeated operations (6).

CONCLUSION

For the most part, skin and subcutaneous tissues are affected by PRS, an uncommon, self-limiting, and slowly progressing hemiatrophy of the face that may also affect deeper tissues including the muscles, cartilage, and osseous elements. Although there are numerous neurologic as well as ophthalmologic symptoms, the underlying aetiology is yet unknown. In severe and progressing cases of PRS, immunosuppressants like cyclophosphamide, methotrexate, corticosteroids, and azathioprine have been utilised. Radiologic evaluations can be used to monitor illness development, exclude alternative differential diagnoses, assess post-treatment outcomes, and estimate the degree of the disease.

Conflict of interest

The author declares that there are no conflicts of interest.

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