ORIGINAL RESEARCH PAPER

Radiodiagnosis

A CASE OF NON-TRAUMATIC BILATERAL DEHISCENSE OF LAMINA PAPYREACEA

KEY WORDS: Lamina papyreacea, Bilateral dehiscence, Non-traumatic, Orbital herniation

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ABSTRACT

To report a case of non-traumatic bilateral dehiscence of lamina papyreacea.
To radiologically investigate a case of 60 year old female who presented with complaints of repeated history of rhinitis.
A 60 year old female presented with complaints of congestion, discharge, sneezing not improved despite of appropriate allergy avoidance measures and intranasal steroids along with complaints of diplopia.
Contrast enhanced multislice multidetector computed tomography scan (MDCT) of the paranasal sinus was performed on a 128 multislice machine. Axial, coronal and 3D images were obtained.
Unenhanced multiplanar multiecho magnetic resonance imaging (MRI) of the paranasal sinus was performed on a 1.5 Tesla machine. Axial and coronal T1W, T2W FSE and STIR images were obtained.
Radiological evaluation revealed; defect in the bilateral lamina papyreacea through which the orbital fat is protruding into the bilateral anterior ethmoidal cells.
Dehiscence of lamina papyreacea and herniation of the orbital contents may result from congenital defect of nasofacial trauma, age related factors may also contribute.
Iatrogenic injury to lamina papyreacea can occur during surgical procedures or nasal instrumentation.
Bilateral defect is most commonly associated with trauma but rarely seen congenitally and can present with any symptoms at any age.

Abbreviations:
Magnetic Resonance Imaging (MRI)
Multidetector Computed Tomography (MDCT)

Introduction:
Dehiscence of the lamina paprycea may be congenital or acquired (after trauma or surgery). The characteristic feature of dehiscence is a bony defect in the medial orbital wall or an inward displacement of the wall into the ethmoidal complex.

The orbital fat and the medial rectus muscle often protrude through this gap into the ethmoidal bulla, which is usually small in size. Other orbital structures like optic nerve or even the globe itself may herniate [1].

Clinical relevance of this abnormality when recognized should be reported to otolaryngologists to avoid possible complications e.g. perforation of the orbital wall and damage to the globe & extra-ocular muscles during FESS (Functional Endoscopic Sinus Surgery).
We present a case of non-traumatic bilateral dehiscence of lamina papyreacea in which the diagnosis was confirmed by MDCT and MRI.

Material and Method:
Contrast enhanced multislice multidetector computed tomography scan (MDCT) of the paranasal sinus was performed on a 128 multislice machine and unenhanced multiplanar multiecho magnetic resonance imaging (MRI) of the paranasal sinus was performed on a 1.5 Tesla machine in order to obtain maximum diagnostic output and minimize the dose of radiation.

Case report:
A 60 year old female presented with complaints of congestion, discharge, sneezing not improved despite of appropriate allergy avoidance measures and intranasal steroids. She also had complaints of diplopia since 1 year. Detailed past history revealed no history of trauma/surgical instrumentation and nasal instrumentation. On CT scan, there is protrusion of fatty material into the bulla cells through a gap in the right and left lamina papyracea. This fatty mass was of the same density as, and in continuity with, the orbital fat (figure 1, 2, 3 & 4). On MRI, defect in the bilateral lamina papyreacea through which the orbital fat is protruding into the bilateral anterior ethmoidal cells (figure 5 & 6).

Discussion:
The ethmoid bone is frequently the site of anatomic variations [2]. Skull dissections performed in 1869 by Hyrtl [3] and in 1893 by Zuckerkandl [4] revealed gaps in the internal orbital wall. A few years later in 1901, Sieur and Jacob [5] observed similar findings in five of 200 skull dissections. The reported incidence of this anomaly varies greatly. The total incidence dehiscence of lamina papyracea was 10.9%, and natural dehiscence of primary anatomic variation was 5.8%. In a study carried out by Dong Il Shin et al 43.3% had dehiscence of right side, 50% had dehiscence of left side, and 6.7% had dehiscence of both side [7]. Depression of lamina papyracea anterior to the basal lamella were more common those of the posterior depression. There is a statistically significant correlation between the increasing age and the incidence of dehiscence of lamina papyracea [8]. Grading of the dehiscence of lamina papyracea is described in table 1 [9].

Conclusion:
The incidence of non-traumatic prolapse of the orbital content is far beyond general expectations, and detailed structural information for this anatomic alteration may be important before endoscopic sinus surgery to avoid possible complication. The higher incidence in adult may suggest age-related acquired etiologic factors besides congenital dehiscence or weakness of the lamina papyracea.

Table 1: Showing the degree of dehiscence of lamina papyracea

Degree	Description
I	Less than one third of the lamina papyracea involved
II	Less than two thirds of the lamina papyracea involved
Table 1: Showing the degree of dehiscence of lamina papyracea III	More than two thirds of the lamina papyracea

Figure 1: Axial image show focal dehiscence of the right lamina papyracea with focal herniation of orbital fat into ethmoid sinus (arrows). The medial rectus muscle has slight irregular contour.

Figure 2: Protrusion of orbital fat through the ethmoid into the ethmoid bulla on left side. The posterior limit of the fatty mass is the basal lamella. The anterior limit is the bulla lamella.

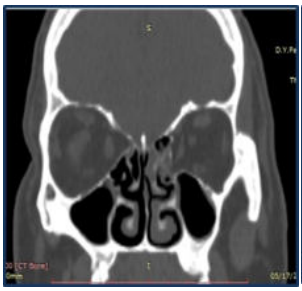

Figure 3: Coronal CT image show focal dehiscence of the right lamina paprycea with focal herniation of orbital fat into ethmoid sinus filling the ethmoid bulla.

Figure 4: Coronal CT image showing defect in the right lamina papyreacea.

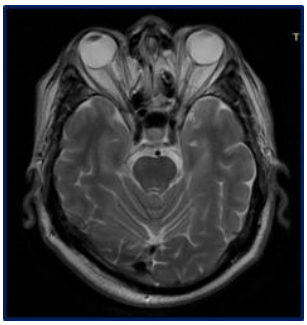

Figure 5: Axial T2W image shows dehiscence of the right lamina papyreacea with herniation of the orbital pad of fat.

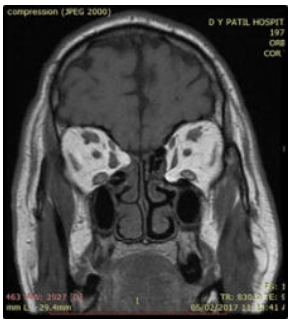

Figure 6: Coronal T2W image of the paranasal sinus revealed focal dehiscence of the bilateral lamina papyreacea (left > right). Note the thinning of the medial rectus muscle on the left side.

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