Original Research Paper

Volume-8 | Issue-10 | October-2018 | PRINT ISSN No 2249-555X

Neurosurgery

MORPHOMETRIC VARIATION OF DIAPHRAGMA SELLA AND ITS NEUROSURGICAL IMPLICATION

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KEYWORDS :

AIM

The diaphragma sella ,is the dural membrane in the sellar region and forms the roof of the hypophysis. Despite immense clinical as well as surgical implications very few dedicated studies are available on this structure. Aim of this is to analyse the diaphragma sella morphometry in relation with pathological and surgical implications.

MATERIALS & METHODS

This is a prospective study done over a period of six months on fifty fresh cadavers which were randomly selected.Totally fifty fresh cadavers were examined for this study. Age varies from 20 to 65 years, with the mean age is 47. Among the 50 cadavers , 29 are males,21are females. Mean age for females is 30 and mean age for males is 22. For measurment purpose , vernier caliper was used. Cadavers with head injuries, pituitary diseases, burns, more than 12hrs old and less than 17 years are excluded.

RESULTS

Morphology of diaphragma sella is not uniform in all cadavers. It can be easily recognised by observing its margins at its opening. In eleven cadavers , dural membrane was of full thickness at its margins of opening. Among them 7 were male,and 4 were female cadavers.

In thirty-one cadavers sella dura became membranous towards stalk opening. Normal thickness of the dura at the periphery gradually transformed in to a transparent membrane. Among them 18 were male and 13 were female cadavers.

In eight cases diaphragma sella is partially or completley absent and weils of thin membrane covers the hypophysis. Among them 4 were male and 4 were female cadavers.

Position of stalk in relation to opening of diaphragma sella was documented in all cases. Sellar opening was divided into eight areas, including four quadrants, anterior midline, posterior midline and central region.

In twenty-two cadavers, the stalk occupies central region of the sellar opening. In twenty one cadavers stalk occupies posterior midline region. In four cases it occupies anterior midline region. In one case stalk passes through left anterior quadrant. In two cases stalk passes through left posterior quadrant.

The right anterior as well as posterior quadrants of sellar opening did not contain stalk in any of the cases.

Shape of the opening was observed in all the cadavers. In twenty one cases opening for the stalk was oval in coronal plane. Among them 13 were male and 8 were female cadavers. In five cases it was oval in sagital plane. Among them 1was male and 4 were females. In seventeen cases it was circular. Among them 12were male and 5 were female. In eight cases it looked triangular in nature. Among these cases of triangular opening apex of the triangle pointed dorsally in four cases , in one case it pointed ventrally, and in one case apex pointed to the right side. In no cases apex of the triangle pointed left side. Among them 4 were males and 3 were females. In only one case it was biconvex in the coronal plane.

Dimensions of diaphragma sella opening are as follows, Mean anteroposterior diameter in male cadavers was 5.96 mm. Mean anteroposterior diameter in female cadavers was 5.90 mm. Mean transverse diameter in male cadavers was 7.74mm Mean transverse diameter in female cadavers was 6.96 mm Mean anteroposterior diameter in total cadavers was 5.93 mm. Mean transverse diameter in total cadavers was 7.41 mm.

Anteroposterior and transverse diameters of pituitary stalk as follows, Mean anteroposterior diameter in male cadavers was 1.91mm. Mean anteroposterior diameter in female cadavers was 2.05 mm Mean transverse diameter in male cadavers was 2.37mm Mean transverse diameter in female cadavers was 2.40 mm Mean anteroposterior diameter in total cadavers was 1.97 mm. Mean transverse diameter in total cadavers was 2.38 mm.

CONCLUSION

Diaphragma sella , a dural layer which forms the roof of the hypophysis has developmental, pathological, as well as surgical implications.

1. According to its morphology it can be divided in to three types.
(1) Type A was defined as thickness of the membrane is uniform up to its margins of opening.
(2) Type B was defined as gradual thinning of membrane towards the margins of opening.
(3) Type C was defined as deficient or absence of membrane except for thin weils of membrane at its margins.

Among these three types, Type B is the most common type in both sexes.

2. Elliptical opening for stalk is the most common type than circular and triangular openings.
3. Transverse diameter of the diaphragmatic opening is more than anteroposterior diameter.
4. Pituitary stalk passes through the centre of the diaphragmatic opening in majority of cases.
5. Transverse diameter of pituitary stalk is more than anteroposterior diameter.