Erratum :

This article appeared in Vol. 12, 4 de SRA with an error in the enlargement of the figures. We are therefore reproducing it, in part, with an improved illustration. The Editor

Cet article est paru dans le Vol. 12, 4 de SRA avec une erreur dans l'agrandissement des figures. Nous le reproduisons donc partiellement avec une meilleure iconographie. La Rédaction

The commissuro-mamillary plane in MRI of the brain (preliminary communication)

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Summary. MRI sections of the brain in the coronal plane through the line joining the anterior commissure and the mamillary bodies display the constituent parts of the basal forebrain. The visualisation of the septal nuclei and the anterior columns of the fornix show the importance of this plane in the study of behaviour disorders and amnesic syndromes.

Le plan commissuro-mamillaire dans l'exploration IRM de l'encéphale
(Note préliminaire)

Résumé. Des coupes IRM de l'encéphale, réalisées selon un plan coronal oblique joignant corps mamillaires et commissure blanche antérieure, permettent de visualiser les différents constituants du cerveau basal antérieur. La mise en évidence des noyaux septaux et des piliers antérieurs du fornix souligne, l'intérêt de ce plan pour l'exploration des troubles comportementaux et des syndromes amnésiques.

Key words : Neuroanatomy — Brain — Limbic system — MRI

MRI of the brain does not usually provide easy recognition of the structures in the limbic system [2]. A coronal section adapted to the anatomy of the anterior base of the brain is proposed.

Material and methods

Cf. SRA 12, 4 : 299-301.

Results and discussion

The illustrations show the anatomical relationships seen on the sections. The anterior commissure and the mamillary bodies are by definition shown in the sections (Figs. 1 and 2). The term "basal forebrain" refers to a heterogeneous group of structures in the telencephalon and diencephalon situated in the ventral part of the brain, at or below the anterior commissure. Some of these structures are on or near the midline, such as the septal

nuclei, the preoptic region and the anterior hypothalamus, and the nucleus accumbens. Others are more lateral, in what is usually called the innominate substance; they consist in the extension beneath the anterior commissure of the striatum and pallidum, (constituting with the accumbens nucleus the ventral striatum concept), the cholinergic magno-cellular groups and more laterally the amygdaloid complex.

Numerous histological and biochemical changes occur in the region in disorders such as schizophrenia, Parkinson's disease, and Alzheimer's dementia. Both in animals and humans it is clear that this region plays a major role in behavior and memory [1].

The structures close to the midline are those which are the most difficult to identify clearly by MRI. The anterior commissure is, however, a principle landmark in the basal forebrain [6, 8]. It appears to be essential to include a coronal section through this commissure if the structures over and beneath the commissure are to be individually distinguished.

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Fig. 1

Fig. 1

Fig. 2

Fig. 2

Fig. 1

The commissuro-mamillary line and plane in MR. **a** Above: to show the line drawn on a mid-sagittal MRI section joining the center of the anterior commissure rostrally to the center of the mamillary body caudally (sequence MPGR 110, with TR 560 ms, TE 9 ms, thickness: 5 mm, Nex 2, matrix 256×192 , FOV 24 cm) **b** below: to show the MRI section through the commissuro-mamillary plane; the image was obtained with T1 weighting and an inversion-recovery sequence (TR 2,500 ms, TI 800, TE 20 ms, thickness 3 mm, Nex 2, matrix 256×192 , FOV 24 cm); the section emphasises the contrast between grey matter (the intermediate signal) and white (the relatively high signal). To be noted from above to below in contact with the midline: the septum lucidum, the septal nuclei, the anterior commissure, the anterior columns of the fornix in the hypothalamus, and the mamillary bodies projecting into the interpeduncular fossa. The lateral fibers of the commissure exactly limit the region called the innominate substance (which is known to correspond to the ventral striatum and which contains the magnocellular cholinergic nuclei)

Ligne et plan commissuro-mamillaires en IRM. **a** En haut : affichage de la ligne joignant le centre de la commissure blanche antérieure, rostro-dorsalement, au centre du corps mamillaire, caudo-ventralement, sur la coupe sagittale (séquence MPGR 110, avec TR 560 ms, TE = 9 ms, épaisseur = 5 mm, Nex = 2, matrice = 256×192 , FOV = 24 cm) **b** en bas : affichage du plan de coupe IRM coronal oblique, correspondant à la ligne précédente; obtenue dans la pondération T1 d'une séquence inversion-récupération (TR = 2 500 ms, TI = 800, TE = 20 ms, épaisseur = 3 mm, Nex = 2, matrice = 256×192 , FOV = 24 cm), la coupe souligne le contraste entre la substance grise (de signal intermédiaire) et la substance blanche (de haut signal relatif). Notons, de haut en bas, et au contact de la ligne médiane : le septum-lucidum, les noyaux du septum, la commissure blanche antérieure, les piliers antérieurs du fornix dans l'hypothalamus et les corps mamillaires, saillants dans la fosse interpedonculaire. Les bras latéraux de la commissure blanche antérieure délimitent parfaitement la région appelée substance « innominée » (dont on sait qu'elle correspond au striatum ventral et qu'elle contient les noyaux cholinergiques magno-cellulaires)

Fig. 2 Anatomical sections of the head made in the same oblique commissuro-mamillary plane. The surfaces of adjacent sections are shown, separated by 2 mm (posterior and anterior segments) with the same thickness as in Fig. 1. **a** Above: the same succession of structures is shown: septum lucidum, septal nuclei, anterior commissure, anterior columns of the fornix, mamillary bodies. To be noted in addition is the amygdala **b** below: in addition to the same midline succession, there are seen laterally, in the grey matter of the hypothalamus, the medial forebrain bundle

Coupes anatomiques de la tête réalisées dans le même plan commissuro-mamillaire, coronal oblique. Les deux photographies de surface de coupes adjacentes séparées de 2 mm (segments postérieur et antérieur) répètent l'anatomie numérique (épaisseur) détaillée sur la Fig. 1. **a** En haut : la même succession de structures est observée : septum lucidum, noyau du septum, commissure blanche antérieure, piliers antérieurs du fornix, corps mamillaires. Notons, de plus, l'amygdale. **b** en bas : outre la même succession verticale, notons latéralement, dans la substance grise de l'hypothalamus, le faisceau médian du télencéphale