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## McBurney's point: Are we missing it?

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**Abstract** A prospective study of 100 post-evacuation barium enemas was done. Films were centered at McBurney's point, with an opaque skin marker at that point. Analysis of these revealed that in only one case (1%) was the base of the appendix at McBurney's point. In 67% it was cephalic and in 32% it was caudal to this point. The limitations of McBurney's point as an anatomical landmark should be recognized. This needs to be highlighted in teaching anatomy, especially to surgical trainees. Planning and choice of surgical incisions should be based on an understanding of these anatomical variations since McBurney's original description was clinical rather than anatomical.

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### Le point de McBurney: va-t-il disparaître?

**Résumé** Une étude prospective a été réalisée sur 100 clichés après évacuation de lavement baryté. Ces clichés étaient centrés sur le point de McBurney, marqué par un repère cutané opaque. L'analyse de ces radiographies a montré que, dans un cas seulement (1%), la base de l'appendice correspondait au point de McBurney. Dans 67% des cas, cette base était plus céphalique et, dans 32% des cas, elle était plus caudale par rapport à ce point. Les

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limites du point de McBurney comme repère anatomique doivent être connues. Cela devrait être souligné dans l'enseignement de l'anatomie, notamment pour les futurs chirurgiens. Prévoir et choisir une voie d'abord chirurgicale devrait être basée sur la connaissance des variations anatomiques puisque la description originale de McBurney était beaucoup plus clinique qu'anatomique.

**Keywords** McBurney's point · Vermiform appendix · Anatomical variation

### Introduction

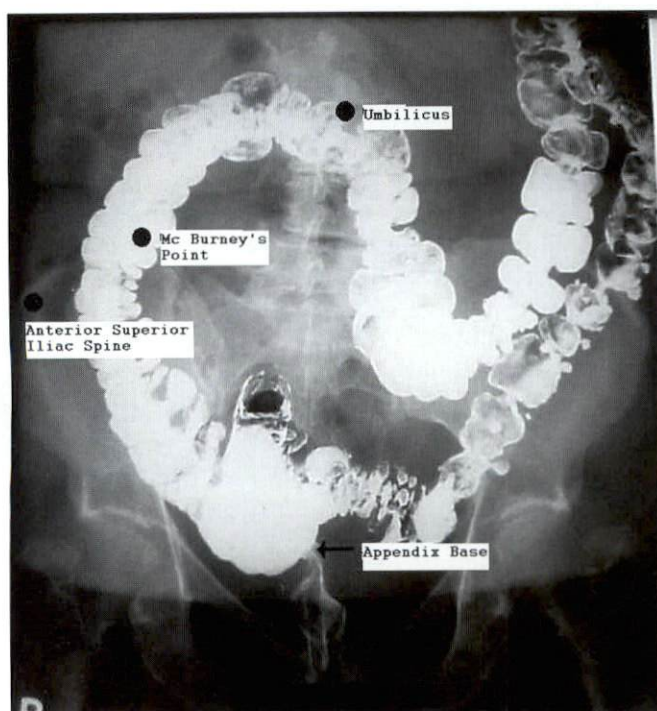
More than a century ago, McBurney described a point of maximal tenderness in acute appendicitis, stating "the seat of greatest pain, determined by the pressure of one finger, has been very exactly between an inch and a half and two inches from the anterior spinous process of the ilium on a straight line drawn from that process to the umbilicus" [10]. The landmark for the base of the appendix as described in textbooks as "the junction of the lateral and middle thirds of a line extending from the right anterior superior iliac spine (ASIS) to the umbilicus" in fact inaccurately misquotes McBurney's description [15]. Otto Lanz also described a surface marking of the base of the appendix as one-third the distance from the ASIS along a line joining the two anterior superior iliac spines [8]. Naturally, the point described by Lanz lies inferior to McBurney's point, which is supported by some studies [7, 13]. To further confuse the picture, the World Organization of Gastroenterology has shown that less than half of all patients with appendicitis have maximal tenderness over McBurney's point [4]. Additionally, the variation in the position of the appendix depends on the rotation of the mesenteric loop and the McBurney's point is the point where somatic pains project in the parietal peritoneum.

The aim of this prospective study was to determine the site of the base of the appendix using double-contrast post-evacuation barium enemas.



## Materials and methods

A study consisting of 100 consecutive patients attending the General Hospital, Port-of-Spain, Trinidad was done. Each patient underwent double-contrast barium enemas for suspected large bowel disease. There were 45 males and 55 females (male to female ratio 1:1.2) ranging in age from 5 to 82 years (mean 27 years). Prior to the film, a radiopaque marker was placed on the skin at the junction of the lateral and middle thirds of a line joining the right ASIS to the umbilicus (McBurney's point). The post-evacuation view was centered at McBurney's point to minimize off-center geometric magnification. All examinations were performed on a remote-controlled fluoroscopic unit. Films were done in the supine position to mimic the situation in which clinical examination and surgical procedures are carried out (Fig. 1). All patients with right colon disease, any form of intestinal obstruction, previous



**Fig. 1** Supine radiograph of a double-contrast barium enema showing the relationship between McBurney's point and the appendix base. Three radiographic markers (one at the anterior-superior iliac spine, one at the umbilicus and one at McBurney's point) were used to illustrate the surface anatomy

**Table 1** The relationship of the appendix base in cephalic and caudal directions to McBurney's point (cm)

| Distance of appendix base from McBurney's point (cm) | No. of patients with appendix base cephalic to McBurney's point | No. of patients with appendix base caudal to McBurney's point |
|--|---|---|
| 1  | 6   | 6   |
| 2  | 18  | 2   |
| 3  | 9   | 2   |
| 4  | 6   | 4   |
| 5  | 8   | 7   |
| 6  | 6   | 4   |
| 7  | 7   | 4   |
| 8  | 1   | 0   |
| 9  | 2   | 1   |
| 10   | 4   | 2   |
| Total  | 67  | 32  |
|  | Mean 4.2 cm   | Mean 4.9 cm   |

intra-abdominal surgery or non-visualization of the appendix were excluded from the study. The first 100 patients without these exclusion criteria were studied.

## Results

In 67% of the patients the base of the appendix was seen to lie cephalic to McBurney's point with a mean of 4.2 cm and a range of 1–10 cm. In 32% of the patients the base of the appendix was seen caudal to McBurney's point with a mean of 4.9 cm and a range of 1–10 cm (Table 1). In one patient the base of the appendix did correspond to McBurney's point (1%).

## Discussion

Numerous studies have demonstrated the variability of the appendix in relation to the cecum [3, 9]. However, very few publications have assessed its precise anatomical relation to McBurney's point. Ramsden et al. [13] demonstrated a more caudal position in most subjects. Our study, however, showed that the appendix lies more cephalic. This may represent a racial variation, our patients being primarily of African and East Indian descent. The variance cannot be due to a distended cecum as all films were performed post-evacuation, and secondly, a view centered at McBurney's point to minimize off-center geometric magnification that may occur with the typical cecal view was employed.

Regardless of the position of the base of the appendix, these findings have clinical significance since some surgeons still employ the classic McBurney's incision [11]. The obliquity of the skin incision may compensate for the variation in position by allowing access to the cecum and appendix base that may lie superior or inferior to this point. Occasionally, it is still difficult to gain access through this incision and the Kocher's modification (muscle cutting) or the Fowler-Weir incision (extending into the rectus sheath) may be necessary to perform the appendectomy [2]. However, many surgeons are now using the more cosmetically acceptable transverse skin incision where upward and downward



extensions may be more difficult [1, 5, 6, 8, 15]. A minimally invasive technique employing a transverse 1.5–2.0 cm incision has been described in our setting [12].

The marked variation in the position of the base of the appendix in relation to McBurney's point is clinically significant. In the authors' experience, whenever the base of the appendix lies caudal to this point it is usually possible to deliver the appendix and perform an appendectomy without having to extend the transverse incision. However, when it lies cephalic to McBurney's point, access to the cecum and appendix is considerably more difficult and muscle-cutting extensions are more often necessary.

It is therefore important for surgeons using transverse skin incisions to consider performing the muscle-splitting technique when the appendix lies cephalic to McBurney's point in order to gain easier access to the base of the appendix [12]. This minimizes the need for muscle-cutting extensions and extensive mobilization of the cecum, and surgeons in training may need to be made more aware of the limitations of the popular McBurney's point.

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