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学 位 論 文 題 名	Foot pressure pattern, hindfoot deformities, and their associations with foot pain in individuals with advanced medial knee osteoarthritis
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## 論文内容の要旨

### 研 究 目 的

To clarify foot pressure pattern and hindfoot deformities in individuals with advanced knee osteoarthritis (OA) and analyze their associations with foot pain.

### 対 象 ・ 方 法

Sixty-four individuals with unilateral knee OA who received total knee arthroplasty (TKA) were divided into the following groups: no foot pain (n=26; men: women=4:22; mean age, 73.7 years), foot pain resolved after TKA (12; 2:10; 75.8), and foot pain remaining after TKA (26; 4:22; 74.7). Elderly individuals without any pain or deformity in either knee (54; 10:44; 74.3) served as controls. Navicular height ratio of medial longitudinal arch (%MLA), leg-heel angle (LHA), and partial foot pressure as the percentage of body weight (%PFP) were measured at a comfortable speed during walking.

### 結 果

%PFP of the heel region before TKA was significantly lower in the no foot pain group

than the controls ; 1 year post-TKA, %PFP improved significantly. In the foot pain resolved group, before TKA, LHA was significantly higher, and %PFP of the heel region and %MLA before TKA were significantly lower than the controls ; 1 year post-TKA, all improved significantly. In the foot pain remaining group, similar abnormalities were observed before TKA ; however, no significant improvements were observed 1 year post-TKA.

## 考 察

In the present study, 38 cases (59.4%) of 64 individuals with advanced knee OA had foot pain before TKA, but no cases exhibited any OA in radiographs of the ankle or subtalar joints. For example, individuals with varus OA of the knee should be examined for fixed hindfoot valgus deformity. Therefore, flatfoot and subtalar joint pronation should be examined in patients with knee OA. Over-pronation of the foot was observed in individuals with advanced knee OA who complained of foot pain. In the 26 patients whose pain was unresolved after TKA in the present study, similar abnormalities were observed before TKA ; however, only %long and %PFP of the heel region improved significantly 1 year later. These findings suggest hindfoot deformities are probably associated with foot pain in individuals with knee OA, indicating reversible or irreversible PTTD probably affects pain relief or continuity thereof. It is well known that PTTD is reversible in many patients and irreversible in others. The results suggest foot deformities should be noted during preoperative evaluation and planning for knee deformity correction.

## 結 論

Over half of the patients with advanced knee OA had foot pain, which improved in approximately one-third of them 1 year after TKA. Reversible or irreversible hindfoot deformities are probably associated with foot pain in individuals with advanced knee OA.

## 引 用 文 献

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## 論文審査結果の要旨

人工膝関節置換術（TKA）の前後に変形性膝関節症患者さんに認められる足部痛の頻度，病態と経過を明らかにした論文で，学位論文に値するものと判断する。

要旨：TKAの対象となる進行した変形性膝関節症患者さんでは，足部痛の合併が非常に多く，術前に足部痛がある場合には後足部の変形が見られ，TKA後の足部痛の消失と後足部変形の可逆性が関連している。

斬新さ：変形性膝関節症と足部痛の関連性はこれまで注目されておらず，機序も明らかにされていなかったが，これを後足部の変形と足圧分布から検討した点が斬新である。

重要性：進行した変形性膝関節症に伴った足部痛の頻度，機序と経過が明らかとなり，TKA後の理学療法を選択等，有用な情報が得られた論文である。

実験方法の正確度：対象の設定が吟味されており，臨床に即した選定となっている。対象者数も対照群を含め十分であった。また，測定機器の設定や測定環境も再現性が認められる。

文章の簡潔明確性：問題点がしっかり提起され，目的が明確である。方法においては根拠がはっきりし，分析も的確に行われ，検証や考察も十分行われている。