

# **FAILURE OF SELF BRACING AT THE SACROILIAC JOINTS: The Slipping Clutch Syndrome**

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## **ABSTRACT**

A new syndrome is described in eight patients with back pain who experienced unexpected falling. The falls are attributed to a mechanical-dysfunction of the posterior ligamentous support of the sacroiliac joints. This syndrome follows trauma to the trunk. The condition is seemingly cured with proliferant injections to the posterior sacroiliac ligaments.

## **INTRODUCTION**

Accounts of sudden falling, for hitherto unclear reasons, are commonly heard in back pain clinics. Recent research has demonstrated that the sacroiliac joints, not only contribute to walking with movement in each step, but are unique among the synovial joints of the human body in that they serve also as a friction device. This article suggests that bracing at this clutch is an essential component of the walking mechanism. There is no animal model for this as humans are the only biped mammals. The bracing is based on a self regulated mechanism which depends on the normal function of ligaments in the pelvis, specifically the posterior sacroiliac ligaments. This article suggests that after trauma these structures are disrupted subtly and that they can be treated effectively by prolotherapy which provokes hypertrophy of normal ligament tissue.

## **MATERIALS AND METHODS**

In the last three years it has become apparent that patients attending a back pain practice, which specializes in treatment with prolotherapy, included a number of patients who reported falling unexpectedly. The charts of all the patients with episodic falling in association with back pain seen during this period were reviewed, and the patients who are no longer attending the practice interviewed by telephone. All the patients reported marked or complete resolution of their pain. Seven of the eight reported complete clearing of the tendency for one leg to give way and the eighth reported rare residual "slippages". Patients were selected for treatment, first by establishing a clinical diagnosis of sacroiliac dysfunction due to ligament insufficiency in the low back and pelvis and the exclusion of other serious disease by examination and the use of imaging and laboratory studies as indicated. The selected patients were treated with manipulation followed by prolotherapy based on a routine described previously<sup>1,2</sup>.

The following table summarizes the patients' data.

Pt	Age	Sex	Date of Injury	Duration of pain	Frequency of falling*	Elapsed time before falling ceased	Severity of residual pain	Duration of follow up	Comments
KS	35	F	8/13/89	25m	F	8m	Mod	8m	Lost to follow up
FG	36	F	12/87	4y	O	2m	Nil	14m	See note
EK	36	M	12/17/72	18y	M	12m	Slight	34m	Slight residual slippage
AG	42	F	10/22/92	5m	M	2m	Slight	5m	
MG	56	M	10/22/92	5m	M	2m	Mod	5m	
PF	33	F	9/18/91	19m	F	1m	Nil	4m	
CE	35	F	12/16/85	7y	F	2m	Slight	15m	Episodic exacerbation
DB	34	F	3/2/86	7y	F	1m	Mod	2m	Still in Treatment

\* Frequency of falling: F = Frequent; M = Moderate; O = Occasional

Note regarding Patient FG. This woman was cured both of the pain and falling for ten months. After the difficult vaginal delivery of her second child the tendency to falling has recurred slightly, but not the back pain.

## DISCUSSION

The frequency of sudden falls or giving way of one lower limb in back pain practices is unknown. An informal survey of a number of practitioners with experience indicates the incidence to be up to 15%. There is always an account of an injury. It is thought that this symptom may have been passed off by practitioners as "hysteria", "inexplicable" or "malingering". This paper describes the diagnosis and treatment of a series of patients in an internal medicine practice specializing in orthopedic medicine, which includes a referral for management of low back pain with prolotherapy. Note was taken only occasionally of the symptom of falling as it was, at first, inexplicable to this author. In the last two years, since recognizing the distinctiveness of episodic falling in this context, questions about falling have elicited several cases, which would almost certainly have been ignored before. Treatment for pain with prolotherapy led to the spontaneous report by a number of the patients that their falling had ceased, thereby, through serendipity, the slipping clutch syndrome was discerned.

## FUNCTION OF THE SACROILIAC JOINT

Bipedality amongst mammals is a distinctive human trait. Therefore a look at the anatomy of the sacroiliac joints and their function in walking is of interest to anthropologists in studying remote ancestry. Contrarywise, a search through anthropology for hints regarding contemporary function is provocative. Darwin postulated that the ancestors of Homo sapiens were quadruped<sup>3,4</sup>. The earliest (almost complete) humanoid skeleton is considered authoritatively to have been biped<sup>5</sup>. However, both the ancestral connection and the bipedality of this specimen has been questioned<sup>6</sup>. At this time of writing no clear link in human ancestry

to a quadruped organism has been established<sup>7</sup>. Therefore, we need to be cautious before drawing functional analogies from any quadruped mammals, even the apes. Anatomical study shows that the function of the sacrum in all quadruped mammals is unquestionably that of being suspended. On account of the bipedality of *Homo sapiens* it is reasonable to expect both a different anatomical arrangement and different mechanics. The notion that the pelvic ring is immobile (except during parturition) has been discredited<sup>8,9,10</sup>. The normal asymmetry in alignment, as well as the clinical abnormality when this asymmetry is exaggerated has been documented<sup>11</sup>. The movement of the joint with each step has so far not been confirmed dynamically, though generally it is accepted amongst the cognoscenti of manipulation<sup>12</sup>. It has been recognized questionably that in *dysfunction* of the mechanism this mobility is interrupted, to wit, pelvic *somatic dysfunction* occurs, as defined in osteopathy<sup>13</sup>. Recent research has delineated additional peculiar characteristics of this joint, namely, that of a friction device<sup>14,15</sup>.

These disparate observations are comprehensible when the function of the sacroiliac joint is viewed as that of a *clutch*, bracing on the stance side to afford a firm strut for the closed kinematic chain<sup>16</sup> and unbracing on the swing side to allow the elasticity that is stored in the posterior sacroiliac ligaments to be released into the pendular forward movement of the swing leg, and enhance the efficiency of walking<sup>17</sup>. Assuming then, that this is the role of the normal joint it can be understood that bracing on stance, and unlocking of the sacroiliac joint on the swing side constitutes the normal mechanical function of this joint in humans. Failure of the posterior sacroiliac ligaments and other pelvic fascial and ligamentous structures by attenuation and weakness, usually following a major injury, may interrupt this mechanism. It is thought that the bracing is controlled mainly by the posterior sacroiliac ligaments; however, it is probably better to analyze the function wholistically through the tensegrity model<sup>18,19</sup>. During a stride, when there is slippage of the self bracing mechanism at the initial moment of weight bearing on the planted leg balance is lost and a fall occurs. It is therefore not surprising that the process of refurbishing the springs of the clutch, so to speak, that is to say the stabilizing (posterior) ligaments of the sacroiliac joint, is found to restore function to normal.

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