

Correlation between Changes in Patellar Reflex and Functional Biomechanic Disorders in the Pelvis

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Patients with inguinal hernia frequently showed decreased amplitude of the patellar reflex and ipsilateral cranial dislocation of the pubic bone. In most cases, elimination of pubic symphysis asymmetry by manual therapy normalized the amplitude of patellar reflex. Herniotomy also restored symmetry of the symphysis and normalized the amplitude patellar reflex. It is concluded that the state of effector muscles has more pronounced effect on patellar reflex than possible compression of the femoral nerve with the inguinal ligament.

Key Words: *inguinal hernia; dysfunction of pelvis; patellar reflex; manual therapy*

Changes in the parameters of patellar reflex (PR) are markers of functional biomechanic disorders of the pelvis maintained by neurogenic imbalance of myotatic components and characterized by asymmetric disposition of the pelvic bones, in particular, pubic bones. Pathologies of the small pelvis are the most frequent predisposition for such imbalance [1].

A dependency was found between decreased bioelectric activity of the rectus femoris muscle, PR amplitude, and cranial dislocation of the homolateral pubic bone determined visually and by palpation [2].

Changes in PR parameters can be determined by compression of the femoral nerve in the inguinal canal or changes in the effector length. It was hypothesized that PR parameters depend on the state of inguinal ligament compressing the femoral nerve.

The purpose of the present study was to reveal correlations between changes in PR parameters and functional biomechanic pelvic disorders in patients with inguinal hernia (IH).

MATERIALS AND METHODS

A total of 33 patients (20 men and 13 women aged 26-83) subjected to herniotomy at the Surgical Depart-

ment of Novokuznetsk Clinic No. 1 were examined. The patients were selected by the following criteria: diagnosed IH and the absence of other diseases in the region of the inguinal ligament on IH side, neurologic syndrome of lumbar osteochondrosis with pain irradiating to the leg, buttock, or inguinal area, and other diseases interfering with PR examination.

Diagnosis was established on the basis of typical complaints, history and objective examination. Fourteen patients had right, and 19 left IH.

PR was examined by a standard method in lying position with the leg bent in coxofemoral and patellar joints at the right angle. Maximum amplitude of PR on both legs after repeated strokes with neurological hammer on the quadriceps femoris tendon were compared.

Displacement of the pubic bones was evaluated by palpation and visually by location of the fingers of examiner along the cranial edge of the pubic bones.

PR were estimated by neuropathologist who was not aware of dislocation of the pubic bones, while manual therapist was not informed about PR state.

All patients were operated on the next day after admission. Kukudzhinov-II plasty of the posterior wall (joined tendon was sewed to the medial region of the Kuper ligament and iliopubic band up to the inner ring of the inguinal canal) or Girard-Spasokukotskii plasty of the anterior wall with Kimbarovskii suture (apo-

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TABLE 1. Frequency of Cranial Displacement of the Pubic bone and PR Asymmetry in Patients with Various Localization of IH (n=33)

Characteristics		Localization of IH		Total
		right (n=14)	left (n=19)	
Cranial displacement of the pubic bone:	right	11	2	13
	left	3	17	20
Prevalence of PR amplitude	right	4	14	18
	left	7	1	8
	no	3	4	7

neurosis of *musculus obliquus externus abdominis* tucked under *musculus obliquus internus abdominis* and both are sewed to the Poupart ligament) were performed.

To reveal the effect of inguinal ligament state on IH or PR amplitude on the contralateral side, all patients were randomly divided into two sex-and age-matched groups (16 and 17 subjects), the main parameters of the disease were similar in both groups.

In group I, the dynamics of PR amplitude was evaluated before surgery, during recovery of symmetric position of the pubic bones by means of classic manual therapy based on postisometric muscle relaxation. Group II patients were subjected to manual therapy after surgery 1 day before discharging from the hospital.

Significance of differences was estimated by Fisher test.

RESULTS

No complications or deteriorations were observed in the postoperation period. Cranial dislocation of the pubic bone prevailed on the IH side ($p=0.0002$). PR amplitude was significantly decreased on the same side ($p=0.003$; Table 1).

Differences in PR amplitude were revealed in 13 patients from each group. In group I, 12 patients (92.3%) showed equal PR amplitude after reposition of the

pubic bones by manual therapy. This parameter did not change 1 day before discharge.

In group II, PR asymmetry persisted in 5 patients before discharge, which was associated with cranial displacement of the pubic bone on the side with lower PR amplitude. PR recovered and symmetric position of the pubic bones was restored in 7 of 8 patients (87.5%). After manual therapy and normalization of pubic bone position the differences in PR amplitude persisted in 2 patients (15.4%).

Thus, most patients with PR asymmetry showed cranial dislocation of the pubic bone on the IH side. PR was more frequently decreased on the side of dislocation. Symmetric PR amplitude recovered after reposition of the pubic bone by postisometric relaxation more frequently than after herniotomy (83.3 and 61.5%, respectively), which also normalized the location of the pubic bones in most cases.

Thus, in IH patients, positional muscles extension (primarily, rectus femoris muscle) had more pronounced effect on PR amplitude than the extension of the Poupart ligament.

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