

先天性横軸形成障害(前腕欠損)を有する  
パラ水泳選手の身体特性に関する研究  
—スポーツ傷害の予防と競技力向上を目的とした基礎調査—

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**Characteristics of Physique, Static Posture, and Shoulder Range of Motion in Japanese  
Elite Para Swimming Athletes with Unilateral Congenital upper Limb Deficiency  
—A Basic Research for The Prevention of Sports Injury and Improving Sports Performance—**

by

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ABSTRACT

**Purpose:** To clarify the characteristics of physique, static posture, and shoulder range of motion in Japanese elite para swimming athletes with unilateral congenital upper limb deficiency.

**Method:** Participants were six Japanese elite para-swimming athletes with unilateral congenital upper limb deficiency. Height, body mass, upper arm length, forearm length,

maximum brachial circumference, shoulder range of motion, inter-elbow distance, shoulder rotary distance, heel-buttock distance and stream line posture were evaluated. The shoulder range of motion was compared to the general normal range of motion, and asymmetry was confirmed by an existence of side to side difference. Streamline posture of each participant was qualitatively evaluated.

**Result:** Since the range of motion in flexion was restricted in five participants and internal rotation in the deficient limb were more restricted in all participants as well as extension and external rotation in five subjects than the sound side, side to side difference was observed. Inter-elbow distance which reflects flexibility of the shoulder complex was greater when deficient limb was at the upper side in all participants. Excessive lumbar extension in three participants and inadequate shoulder flexion in the streamline position were observed in five participants.

**Conclusion:** Physical characteristics of Japanese elite para swimming athletes with unilateral congenital upper limb deficiency is represented the restricted range of motion in shoulder flexion and internal rotation of the deficient limb. Educational physiotherapy intervention may be required to gain ideal streamline posture, to increase propulsion force, and to prevent swimmer's shoulder.

## 要 旨

目的：先天性片側前腕欠損を有するパラ水泳選手の身体特性を明らかにし、競技力向上のためのトレーニングやスポーツ外傷および障害予防のための基礎資料とする。

方法：先天性片側前腕欠損の日本人パラ水泳選手6名を対象とした。身長、体重、上腕長、断端長、上腕最大周径、肩関節可動域、肘間距離、肩回旋幅、踵臀距離を測定し、デジタルカメラで静止立位でのストリームライン姿勢を矢状面から撮影した。各選手の関節可動域を正常可動域と比較し、左右差をもとに非対称性を検討し、ストリームライン姿勢を質的に分析した。

結果：上腕最大周径は全ての対象者において欠損側で小さかった。欠損側の肩関節屈曲可動域制限が5名の対象者に、内旋可動域制限が全対象者に認められ、全対象者の肩関節可動域に左右差が

生じていた。ストリームライン姿勢の質的分析では過度な腰椎前弯を呈する者が3名、欠損側上肢が最大挙上位に達していない対象者が3名認められた。

結論：先天性片側前腕欠損選手の身体的特徴は、欠損側の肩関節可動域制限および健側との左右差に現れることが明らかとなった。