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## Original Article

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# Orchidopexy for the Double Numbered Cases with Congenital Cryptorchidism in Kitakyushu Area of Japan

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### Abstract

We retrospectively evaluated the data of 293 patients who underwent orchidopexy from January 2015 to December 2017 at 3 pediatric surgical institutions in the Kitakyushu area to elucidate the relationship between the number of cryptorchidism cases and the number of cases treated with orchidopexy. Cryptorchidism was diagnosed at < 12 months of age in 144 of 293 boys (49.1%) and at ≥ 12 months of age in 149 of the 293 boys (50.9%). The younger patients were suspected of having congenital cryptorchidism, whereas, older patients were suspected of having acquired cryptorchidism, as they had been initially evaluated as having normal scrotal testes before one year of age. In acquired cryptorchidism, the testes are usually found at the 18-month or 3-year medical examinations or by chance at the hospital or home in older boys. In conclusion, we performed orchidopexy in double the number of cases of congenital cryptorchidism, likely due to orchidopexy being performed for both congenital and acquired cryptorchidism.

**Key words** : congenital cryptorchidism, acquired cryptorchidism, orchidopexy

### Introduction

The incidence of congenital cryptorchidism has been reported to be about 1% for more than a half century, occurring in 3% of male infants at birth and decreasing to 1% at 3 to 6 months of age due to spontaneous descent of testes after birth ; and this 1% incidence then continues throughout the first year of life<sup>1)</sup>. However, it has been reported that orchidopexy is performed ≥ 2-fold more frequently than the incidence of congenital cryptorchidism<sup>2)3)</sup>. The discrepancy between the incidence of cryptorchidism and the number of orchidopexy procedures has been attributed to the new entity of acquired cryptorchidism, wherein the testes had been found in the scrotum before 12 months of age but spontaneously

re-ascend after 1 year of age<sup>4)5)</sup>. The incidence of acquired cryptorchidism has been reported to be 1%–7%, peaking around 8 years of age<sup>4)–6)</sup>.

This study evaluated the current practical trends in cryptorchidism to elucidate the relevant occurrence of acquired cryptorchidism in the Kitakyushu area of Japan.

### Patients and methods

We analyzed the data on patients who underwent orchidopexy from January 2015 to December 2017 at three tertiary pediatric surgical institutions in the Kitakyushu area. (Kitakyushu City, Yukuhashi City, Buzen City, Miyako Town, Kanda Town and Chikujou Town), with a population of about 1.1 million. The number of patients, age at the diagnosis, and timing of the

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operation were evaluated.

## Results

A total of 293 boys underwent orchidopexy for cryptorchidism during the 3-year study periods. Regarding the age at the diagnosis, cryptorchidism was initially diagnosed at < 12 months of age in 144 of the 293 boys and at ≥ 12 months of age in 149 of the 293 boys (Fig. 1). These older patients had been initially evaluated as having normal scrotal testes at their neonatal and infant medical examinations before 1 year of age and were therefore suggested to have acquired cryptorchidism.

The relationship between the age at the diagnosis and the timing of the operation in acquired cryptorchidism is shown in Fig. 2. Patients usually underwent surgery at the same age as they received their diagnosis, except for in the group of patients who were diagnosed at 1 year of age ; 30% of these patients underwent surgery in the next year.

The relationship between the age at the diagnosis and the observation of testicular ascent in acquired cryptorchidism is shown in Fig. 3. Most cases of acquired cryptorchidism were diagnosed at the 18-month or 3-year medical examinations at one or 3 years of age. However, some cases were initially found beyond 5 years of age through various incidents.

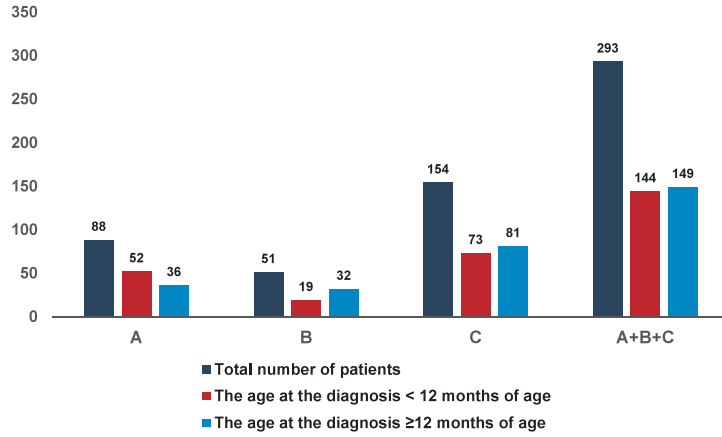
## Discussion

In the Kitakyushu area, routine infant medical examinations are performed at least 5 times : at birth, and at 4 months, 7 months, 18 months and 3 years of age. In the present study, cryptorchidism was diagnosed under 12 months of age in half of our patients, (144 of the 293 boys [49.1%]) ; these were suggested to be cases of congenital cryptorchidism. However, in the remaining half of our patients (144 of the 293 boys [50.9%]), cryptorchidism was initially found at the 18-month or 3-year medical examinations or by chance at home or at hospital after 1 year of age, although

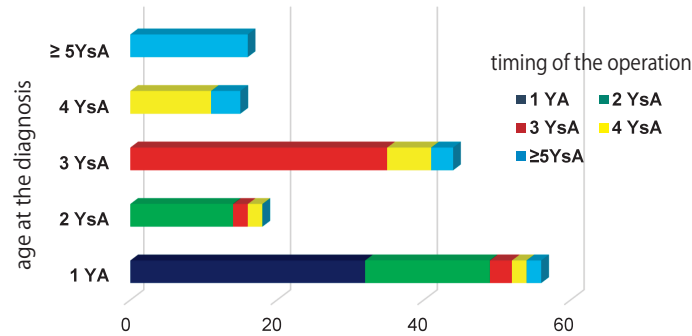
the testes had been normally detected in the scrotum at infant medical examinations up to 12 months of age. Therefore, these were considered cases of acquired cryptorchidism (ascending testis)<sup>2)</sup>, wherein the testes had been found in the scrotum under 12 months of age but spontaneously re-ascended after 1 year of age (Fig. 4). In the present study, acquired cryptorchidism was usually found at the 18-month or 3-year old medical examinations, and were sometimes found beyond 5 years of age. Paediatricians and pediatric surgeons are therefore advised to monitor the testicular position until the age of school entry<sup>6)</sup>.

Regarding the timing of orchidopexy in cases of congenital cryptorchidism, the recently updated guidelines recommend early operation for cryptorchidism at less than two years of age<sup>5)7)8)</sup>. Furthermore, several authors recommend orchidopexy be performed at 6–12 months old in order to obtain a better outcome with regard to fertility and reducing the risk of malignancy in the testes<sup>4)6)9)</sup>. While the testes spontaneously descend at puberty in about half of acquired cryptorchidism cases, Hutson et al<sup>6)</sup> recommended the operation be performed at the diagnosis in cases of acquired cryptorchidism, as testes are damaged more when they remain longer in the high-temperature environment of the inguinal region (36°C ; compared to the scrotum : 33°C). In our study, most of patients underwent surgery at the same age as they received their diagnosis of acquired cryptorchidism. Although, 30% of patients who were diagnosed during 1 year of age underwent surgery in the next year, these patients might have too little time to make the schedule for hospitalization after the diagnosis at the 18-month medical examination.

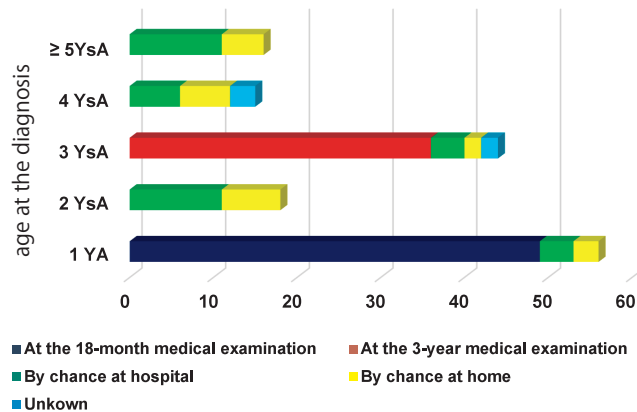
Confusion has existed concerning the definition and treatment of retractile testis, acquired cryptorchidism and mild forms of congenital cryptorchidism. While these testes are usually found above the scrotum, retractile testes are



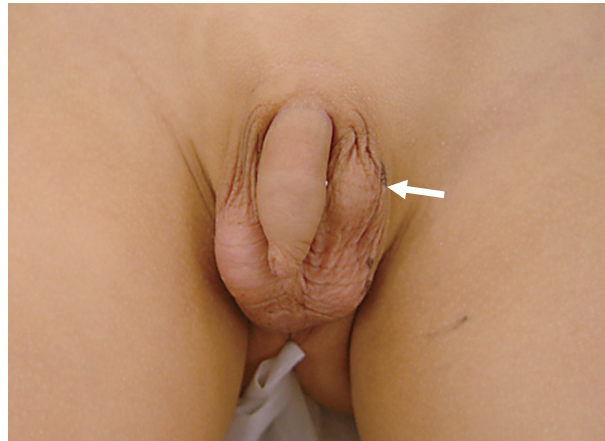
**Fig. 1** The number of patients in three hospitals. More than half of the patients diagnosed at ≥ 12 months of age came from two hospitals (B and C), and less than half came from the remaining hospital (A). In total, more than half of patients were diagnosed at ≥12 months of age. YA ; year of age, YsA ; years of age.



**Fig. 2** The relationship between the age at the diagnosis and the timing of the operation in acquired cryptorchidism. Most patients underwent surgery at the same age as they received their diagnosis, although 30% of patients diagnosed at one year of age underwent surgery the next year. YA ; year of age, YsA ; years of age.



**Fig. 3** The relationship between the age at the diagnosis and the detection of testicular ascent in acquired cryptorchidism. Acquired cryptorchidism was frequently diagnosed at the 18-month or 3-year medical examinations, although some cases were initially diagnosed beyond 5 years of age for various reasons. YA ; year of age, YsA ; years of age.



**Fig. 4** A 3-year-old boy with left acquired undescended testis. Left undescended testis (white arrow) was initially found at the 3-year medical examination, despite both testes having been normally detected in the scrotum at birth and at the 4-month infant medical examination.

defined as normally developed testes that can be manipulated into the scrotal position where they remain for a while after release, and traction on the cord structures is not painful. In contrast, in both mild congenital and acquired cryptorchidism, the testes retract immediately to the groin from the scrotum after release, and traction on the cord structures is painful<sup>2)10)</sup>. Although observation is usually recommended for retractile testes, orchidopexy is recommended for mild congenital and acquired cryptorchidism<sup>2)10)</sup>. In the present study, we performed orchidopexy in double the number of cases of congenital cryptorchidism in the Kitakyushu area, likely due to orchidopexy being performed for both congenital and acquired cryptorchidism, not for retractile testes.

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#### Conflict of interest

None declared.

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(和文抄録)

## 北九州地区では先天性停留精巣症例の2倍多くの 停留精巣手術が行われている

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先天性停留精巣の発生頻度は男児の1%とされているが、欧米の報告では停留精巣に対する精巣固定術は男児の2%以上に実施されている。今回、我々は北九州地区医療圏の小児外科3施設において2015年1月から2017年12月までの3年間に精巣固定術を実施された小児の停留精巣症例を後方視的に検討し、先天性停留精巣の発生数と精巣固定実施数について検討した。3年間に実施された精巣固定術の手術例数は293件であった。このうち1歳未満の新生児健診や4か月または7か月健診で停留精巣と診断された症例は144例(49.1%)であった。残りの149例(50.9%)は1歳までの乳児健診では精巣は陰嚢内にあるとされていたにも関わらず1歳半健診や3歳児健診にてはじめて気付かれた後天性停留精巣と考えられた。小児の停留精巣には先天性停留精巣と後天性停留精巣があるが後天性停留精巣は生後に一旦、陰嚢内に下降した精巣が1歳以降に徐々に再上昇する精巣である。後天性停留精巣は精巣挙筋反射などで一過性に挙上する遊走精巣(移動性精巣)とは異なり陰嚢外に癒着しているため精巣固定術が必要とする意見が多い。近年、北九州地区において精巣固定術が実施されている小児停留精巣症例の約半数が後天性停留精巣である可能性が示唆された。

**キーワード**：先天性停留精巣，後天性停留精巣，精巣固定術