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TRIGGER FINGER

Incidence in Children and Adults and the Possibility of a Predisposition in Certain Age Groups

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The objects of the present study were to investigate the occurrence of trigger finger in an unselected, consecutive series of 694 cases in children and adults and to discuss, on the basis of the sex ratio and age distribution, whether trigger finger has a predilection for certain age groups.

Notta, in 1850, was the first to describe the phenomenon of trigger finger caused by changes in the tendon and tendon sheath. The designation *doigt a ressort* was coined by Nelaton (1858), and the operation of splitting the fibrous tendon sheath was performed first by Schönborn in 1889. In Denmark Poulsen (1908) added 19 cases of his own to the 59 which had been reported in the world literature up till then. A few of his patients were children. Since then, several authors have called attention to the special syndrome in children with a locked trigger finger. However, due to the small number of patients in the individual series, we lack accurate information concerning the incidence of trigger finger in the various age groups and concerning a difference, if any, in the disease when affecting children and adults.

Fogh-Andersen (1947), in a material from the Orthopaedic Hospital, Copenhagen, found that more than half of 147 patients with trigger finger were children under 5 years of age.

Lapidus & Fenton (1952) found that 11 out of 244 trigger fingers occurred in children under 10. They received a number of their patients from a hospital for rheumatic diseases and found the following percental distribution from the thumb to the little finger: 55, 1½, 19, 19, and 6 per cent.

Analysing 52 cases of their own, 12 in children and 40 in adults,

as well as those collected from the literature, Fahey & Bollinger (1954) found trigger finger to occur in boys and girls at the ratio 31/41. It nearly always affected the thumb and was bilateral in 25 per cent of the children. In their adult patients (all women) they found trigger finger to involve the thumb to the little finger with the following frequency: 60, 4, 15, 15 and 6 per cent. While in children trigger finger was equally common on the right and left, the adults were most often affected on the right.

Owing to the reported differences in the distribution of trigger finger upon the individual digits, it has been suggested that the causes of trigger finger might differ in children and adults.

The trigger finger phenomenon is due to spatial disproportion between the tendon and tendon sheath, and a number of space-filling lesions (tumours, ganglia, and synovial diseases) may be responsible. In most cases, however, it is not possible to demonstrate specific changes. In these cases it may be said that the triggering is due to a predisposition to trigger finger as well as to an eliciting cause.

Predisposition. The theory of a congenital predisposition to trigger finger is based upon its presence at birth, its occurrence in monozygotic twins, and its common bilateral occurrence in children.

The common involvement of the thumb and the equal occurrence on right and left in young children indicates that anatomical factors

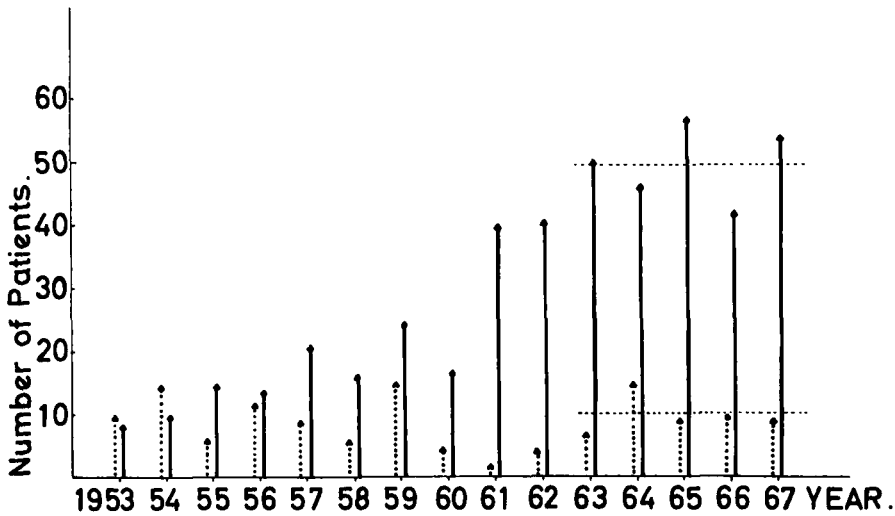

Figure 1. Number of patients with trigger finger seen each year 1953–67. Patients 0–10 years incl. ····· Patients older than 11 years. ——

at the metacarpophalangeal joint of the thumb play a role in its development.

Microscopic studies of tendons from children with trigger finger have shown changes which may have been due to pressure upon the tendon or the sequelae of ischaemia. No signs of inflammation have been found, but in a few cases increased vascularization.

No signs of developmental anomalies in the tendon have been detected. Moreover, the rare occurrence of the phenomenon on the four ulnar digits does not indicate that such anomalies might be an important cause (Fahey & Bollinger 1954).

Trigger finger is a common finding in rheumatoid arthritis, and in some materials of trigger finger in adults about 10 per cent have been diabetics (Sørensen, personal communication).

Eliciting Causes

Trauma is considered to be an eliciting factor in producing trigger finger.

Hyperextension of the metacarpophalangeal joint, heat, pressure, penetrating lesions, injuries, and working with pneumatic tools have been reported as eliciting causes.

Repeated movements of extension and flexion, in particular when done against resistance, may also give rise to the trigger finger phenomenon (Hammer 1934, Sperling 1952).

PRESENT INVESTIGATION

The Orthopaedic Hospital, Århus, serves a population from a large city, smaller towns, and rural areas of a composition corresponding to that of the Danish population in general. The patients are referred by general practitioners, not by hospitals for rheumatic diseases, and traditionally the hospital receives a large number of patients with trigger finger and unelucidated diseases of the hands.

Accordingly, a series of trigger fingers might be expected to be representative. This assumption is supported by the fact that the distribution on the individual digits and the age distribution of the patients over 11 years of age have been uniform year by year.

The series comprises all patients who exhibited signs of trigger finger when seen at the Orthopaedic Hospital, Århus, during the period 1953–1967, inclusive.

This material counts 594 patients with a total of 694 trigger fingers.

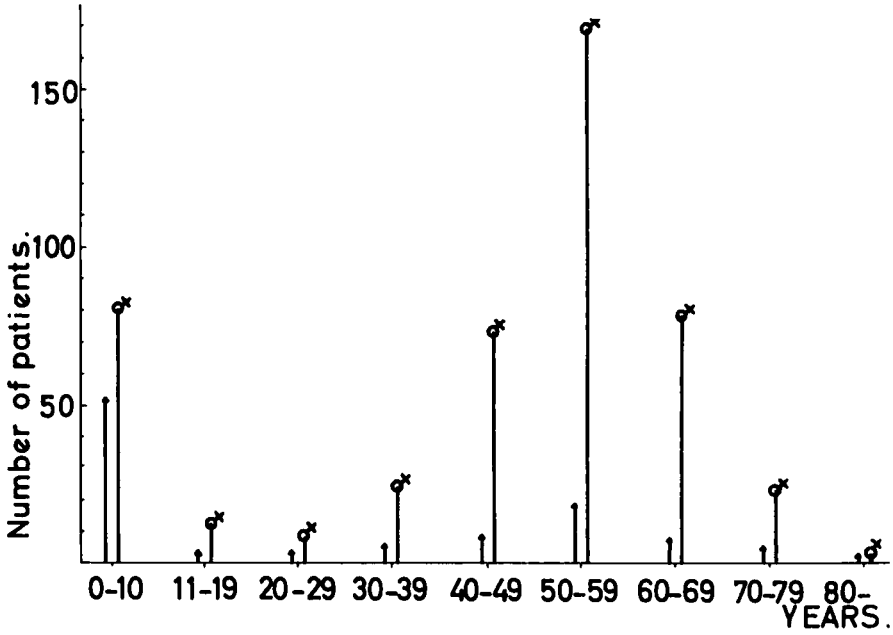

Figure 2. Age distribution of 118 male ♂ and 476 female patients ♀ with trigger finger.

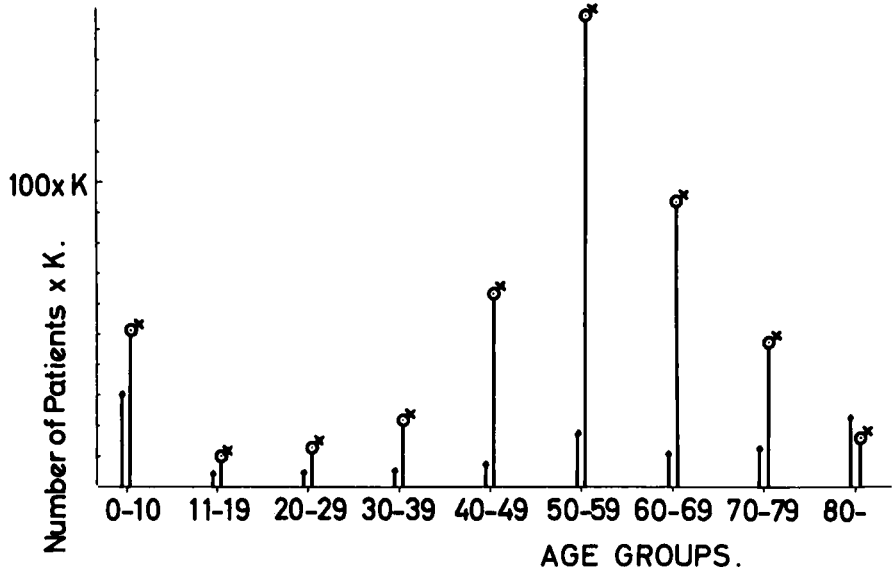

Figure 3. Relative incidence of trigger finger in various age groups. Male ♂ Female ♀.

Figure 4. Patients operated upon for trigger finger in the Orthopaedic Hospital, Arhus, 1963–67. Findings at operation.

	0–10 yrs. incl.	11 yrs. and older
Tumour on tendon	29	34
Tumour on tendon and thickening of tendon sheath	2	17
Thickening of tendon sheath	8	101
	39	152

134 were children aged 0–10 years, with a total of 164 trigger fingers. By including 11 years in the first age group we get all patients with congenital trigger finger with the sole exception of a girl aged 13. The cases in this group were of a uniform type regardless of whether the condition had existed from birth or had developed later.

53 were boys and 81 girls, i.e. a definite female preponderance. 93 per cent of the trigger fingers affected the thumb, the right and left with equal frequency. Both thumbs were involved in 25 per cent of the children.

Figure 1, a graphic presentation of the number of patients seen each year, shows that during the period 1963–1967 children made up some 17 per cent of all patients with trigger finger.

Among patients older than 11 years there were 6 times as many females than males. The disease affected the thumb to the little finger at the rate: 73, 3.4, 8.8, 8.3, and 5.5 per cent. 60 per cent of the trigger fingers were on the right hand.

Figure 2 gives the age distribution for males and females. Presupposing that the material is representative, the average relative incidence of trigger finger in the various age groups may be calculated on the basis of the sex ratio and age distribution of the general population in the years 1955, 1960 and 1965 and the sex ratio and age distribution of the material divided into three five-year groups.

From Figure 3 it is apparent that the incidence of trigger finger has one peak in the age group 0–10 years, for girls as well as for boys. In patients older than 11 the incidence among males is low, evenly increasing with age, while among females there is a very marked peak in the age group 50–59 years, tapering into both adjoining age groups.

During the years 1963–1967 the ratio between children and adults has been constant. The operative findings in the tendon and tendon

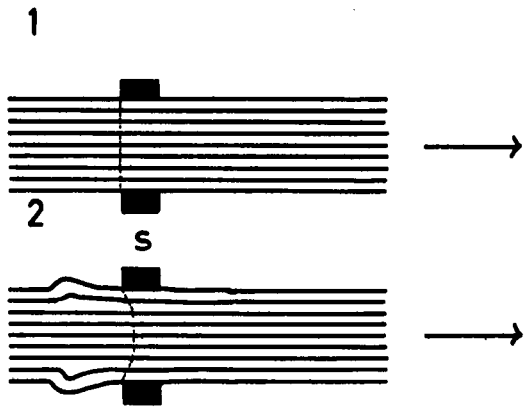

Figure 5. The behaviour of tendon fibres shown in a diagram. S means stenosis.

sheath, to the extent that this may be seen from the case records, are listed in Figure 4.

During the same period 200 women older than 11 years were treated. Among these female patients there were 40, evenly distributed over all 5 years, who had elevated E.S.R., positive rheumatoid arthritis tests, or clinical signs of rheumatoid arthritis.

Comparison of these 40 patients with the group of 200 from which they were derived showed that they seemed to be younger.

In the entire group 27 per cent of the trigger fingers affected the four ulnar digits, in the rheumatoid group 34 per cent.

DISCUSSION

The present study showed two peaks of the incidence of trigger finger, one in the age range 0–10 for girls as well as boys and another one in the age range 50–59 years for women. Since there is no reason to believe that children aged 0–10 years or women around the age of 50 might be particularly exposed to the traumas which are known to elicit trigger finger, it seems reasonable to assume that in these groups of the population there is a particular predisposition to trigger finger.

Operation showed in the patients aged 0–10 years thickening of the tendon in about three-quarters and of the tendon sheath in one-quarter. The reverse applied to patients older than 11 years. The explanation may be that it takes some time to develop thickening of the tendon, so that this will be more marked in children in whom the

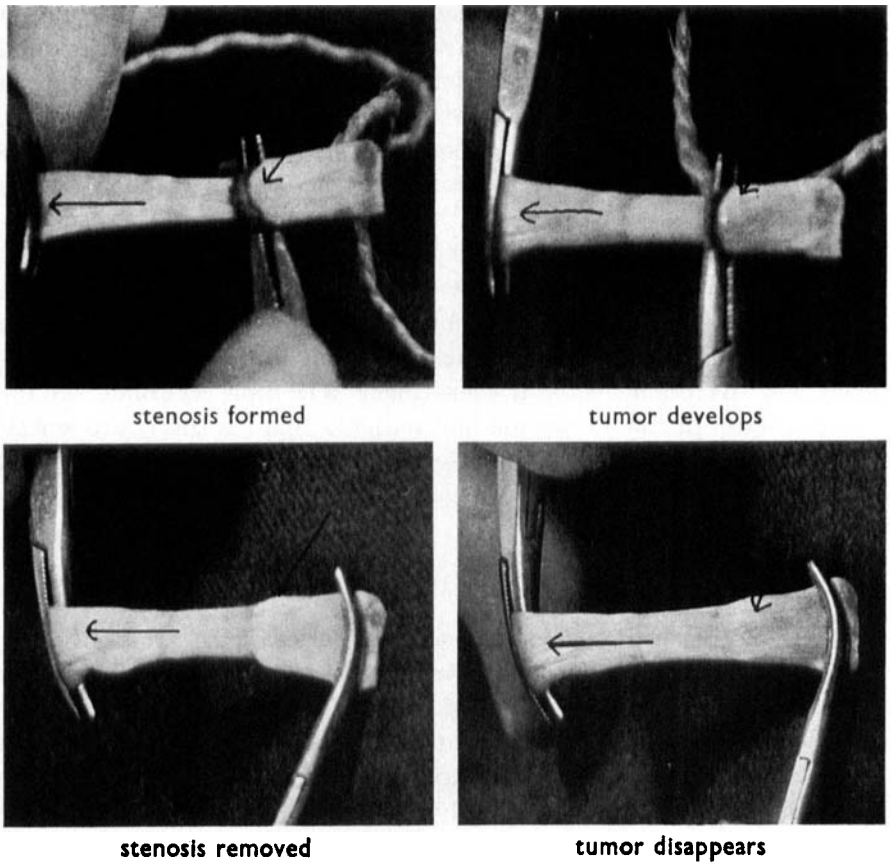

Figure 6.

trigger finger has usually been present longer before operation is performed.

However, it may also indicate that the predisposition to trigger finger in children is related to properties in the tendon, while in adults it may be due rather to properties in the tendon sheath.

When operating upon children it is an experience that their tendons are more "alive" and more difficult to handle than the tendons of adults.

Jeannin (1889) advanced the theory that the tendon, where it passes the narrow place on a level with the metacarpophalangeal joint, is caught in its outer layers and thereafter bulges out behind the obstacle in the manner of woollen yarn threaded through the eye of a needle.

This hypothesis explains the occurrence of trigger finger in children and newborns as well as the characteristic thickening of the tendon in these young patients. The eliciting trauma need not have been external or violent. The greatly flexed position of the thumb at birth, combined with the powerful grasping reflex, may elicit the phenomenon which then may be maintained by accidental traction on the thumb.

The predisposition to trigger finger in females aged 50–59 years is often rheumatic, but probably not solely so. Among 200 women with trigger finger, 40 showed signs of rheumatoid arthritis. Their age distribution did not differ significantly from that of the initial material. On the other hand, trigger finger was more common on the 4 ulnar digits in the 40 rheumatoid patients than in the entire series. This may be interpreted to the effect that apart from the rheumatoid cause there must be another (degenerative, postmenopausal) predisposition.

SUMMARY

On the basis of an unselected, consecutive series of 694 trigger fingers from the Orthopaedic Hospital, Århus, Denmark, during the period 1954–1967, the relative incidence of trigger finger in males and females of the various age groups was calculated. Trigger finger was diagnosed in the age range 0–10 years with approximately the same frequency in boys and girls, but more commonly in girls. 93 per cent of the trigger fingers affected the thumb, the right and left with equal frequency. In 25 per cent of the children the condition was bilateral. Apart from a number of accidental causes, of little numerical importance, there is presumably in children a predisposition to trigger finger related to properties in the tendon, combined with the anatomical factors in the tendon sheath at the metacarpophalangeal joint of the thumb. These properties probably favour the development of tendon thickening. This explains the common finding of locked trigger finger in children. Trigger finger in children at present makes up some 17 per cent of all trigger fingers.

In patients aged 11 years and over, trigger finger was 6 times as common in females as in males, and in 60 per cent it affected the right hand. The percental distribution of trigger finger by site, from thumb to little finger, was found to be: 73, 3.4, 8.8, 8.3, and 5.5 per cent. While the incidence in males is low and evenly increasing with age, women show a very high incidence in the age group 50–59 years,

tapering in the adjoining age groups. Apart from rheumatoid arthritis, the cause is presumably a predisposition to trigger finger postmenopausally.

Thickening of the tendon and locking are less common in adults than in children.

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