initial presentation she became frankly thyrotoxic with a T4 concentration of 18·2 mg/dl (normal = 3·8-12·2 mg/dl) and a T3 resin uptake of 77% (normal = 15-45%). Antibody to *Y enterocolitica* serotype 3 was present at a significant titre of 1/160. Over the next nine months her thyrotoxicosis was difficult to control with carbimazole and she developed a smooth goitre. Subtotal thyroidectomy was performed. At the time of thyroidectomy, antibody to *Y enterocolitica* serotype 3 was present in her serum at a dilution of 1/80. No antithyroid antibodies were detected. Immunofluorescence studies on the excised gland and normal thyroid tissue failed to detect autoantibodies. No bound antibodies were detected.

Family study—No Yersinia antibodies were detected in her parents and four of her siblings, all of whom were euthyroid.

Comment

Actual infection with Yersinia may be related in some way to the development of thyroid disease. Partially supporting this concept is the observation that clinical infections with Yersinia have been followed by the development of various autoantibodies, directed against various tissues including the basement membrane of thyroid epithelial cells.[2 3] Against this view is the finding of antibodies to *Y enterocolitica* serotype 3 in various thyroid diseases that are unlikely to have the same cause.[1 2] These observations seem to suggest that the finding of *Y enterocolitica* serotype 3 antibodies in thyroid disease is incidental. A puzzling feature, however, is that antibody to *Y enterocolitica* serotype 3 has been detected in the sera of patients with thyroid disease from areas of both high[1] and low[2 4] incidence.

Y enterocolitica serotype 3 has a high infectivity. The lack of antibodies in the patient's family may represent the absence of infection or the decline of antibodies to undetectable titres after infection. Yersinia antibodies cross-reacting with thyroid tissue were not detected. This is in contrast to the findings of Lidman *et al*[3] in patients with yersiniosis and no evidence of thyroid disease.

[1] Bech, K, *et al*, *Lancet*, 1974, **2**, 951.
[2] Shenkman, L, and Bottone, E J, *Annals of Internal Medicine*, 1976, **85**, 735.
[3] Lidman, K, *et al*, *Lancet*, 1974, **2**, 1449.
[4] Keddie, N, Metcalfe-Gibson, C, and Tooth, J, *Lancet*, 1977, **2**, 1368.
[5] Toivanen, P, *et al*, *Lancet*, 1973, **1**, 801.

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Motorcycle spoke injury

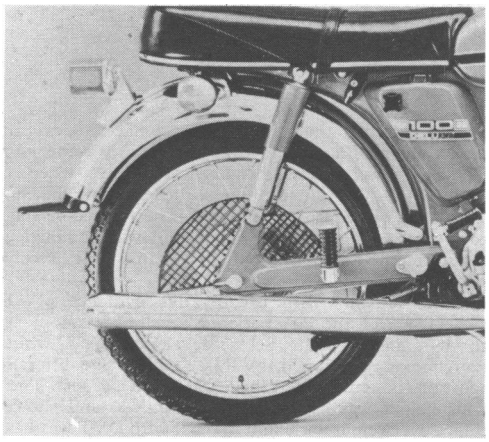
Spoke injury is a hitherto unreported aspect of motorcycle trauma that affects pillion riders. This report describes 21 cases seen in Karachi from October 1976 to February 1978. Typically the victim was seated astride the pillion of a lightweight motorcycle. A sudden jolt dislodged his foot from the footrest, and on the right side the heel readily slipped into the unprotected rear wheel spokes. On the left side the heel was saved by the motorcycle chain-case guarding the spokes.

Series

The victims were all males, aged 10-70 years. Five had not been on a motorcycle before. In some cases three people were riding in tandem on a motorcycle, and the back passenger was injured. A broken right footrest was the predisposing factor in five cases. Jolts were responsible for displacing the foot in most cases. They occurred when the vehicle braked abruptly, cornered, swerved, or hit a pothole on the road.

The injuries were essentially of a stripping type at the back of the heel. Nine patients suffered heel lacerations. Five had partial heel avulsions, the heel flaps being attached caudally and medially. Complete heel avulsion with substantial loss of skin and subcutaneous tissue occurred in six patients. One patient virtually had a guillotine amputation of the back of the heel. The underlying bone and tendon were exposed and damaged to a variable extent. One case was complicated by extensive cellulitis of the leg.

Sixteen of the patients were admitted to hospital, and 14 stayed for 12 to 104 days (mean 41·9 days). Five of these patients underwent delayed cross-limb pedicle grafting and remained in hospital for 77 to 104 days (mean 86·0 days).



Rear wheel of motorcycle with suggested shield in place.

Comment

Viljanto[1] recently reported 103 bicycle and moped spoke injuries in children (1-14 years) riding pillion. Both feet were affected, the heel being injured in 22 cases. Fracture of the leg bones on the affected side occurred in 17 cases. Drewes and Schulte[2] were the first to draw attention to leg bone fractures occurring as a result of bicycle spoke injuries. Analysing 211 fractures of the leg bones in children aged 1 to 14 years they found that nearly 10% of the fractures were due to bicycle spoke injuries. Among the 1- to 4-year-olds (51 cases) bicycle spoke injuries accounted for one-third of the fractures. The higher speed of the motorcycle and its rigid spokes were responsible for the more extensive heel injuries reported here. There were, however, no fractures in this series, possibly because an insufficient force was transmitted upwards. Alternatively, the force might have been better withstood by the older victims.

Spoke injury has come to light following a fourfold increase in the number of registered two-wheelers in Karachi between 1966 and 1977.[3] To prevent it the practice of three people riding on a motorcycle should be discouraged, as should the use of vehicles with broken footrests. Boots should offer protection but may be uncomfortable in a hot climate. Women in Karachi prefer to sit side-saddle with both their feet on the left side of the motorcycle; though it safeguards against spoke injury, this practice exposes them to other dangers.

Drewes and Schulte[2] found that shields covering the upper parts of the bicycle's rear wheel usually prevented spoke injuries in children. The motorcycle chain-case serves as a shield and safeguards the passenger's left heel. To protect the right heel a similar shield should be provided on that side (see figure).

I thank Professor F Elahi, Professor I Waheed, Mr A R Vohra, and Mr Z Oonwala for referring some of the cases.

[1] Viljanto, J, *Annales Chirurgiae et Gynaecologiae*, 1975, **64**, 100.
[2] Drewes, J, and Schulte, H D, *Der Chirurg*, 1965, **36**, 464.
[3] Office of the Excise and Taxation officer, Motor Registration, Karachi 1978. Personal Communication.

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