

Torticollis

A patient guide

In brief: Torticollis, sometimes called wry neck, is not a single disease but a sign: a twisted, tilted or turned posture of the neck in which the head is habitually held to one side. The word is descriptive, derived from the Latin for "twisted neck," and it can arise from a great many different underlying causes. In a newborn it most often reflects tightness of one of the strap muscles of the neck, the sternocleidomastoid, a condition known as congenital muscular torticollis. In an older child it may be an acquired posture provoked by a sore throat, a minor neck injury, or a rotation of the topmost two vertebrae that becomes temporarily stuck, and very occasionally it is the first sign of something more serious within the spine or the base of the skull. In adults the picture is different again, where the commonest persistent form is cervical dystonia, also called spasmodic torticollis, a neurological condition in which the neck muscles contract involuntarily. The single most important idea is that torticollis is a posture with many possible explanations, the great majority of them benign and self-limiting, but a small number of which point to a structural problem of the cervical spine that a spinal surgeon may be asked to assess.

What torticollis is, and why it is a sign rather than a diagnosis

Torticollis describes an abnormal position of the head and neck in which the head is tilted towards one shoulder, often with the chin rotated towards the opposite side. The posture itself is what the term names; it says nothing, on its own, about why the neck is held that way. For this reason it is best thought of as a clinical sign, much as a limp or a fever is a sign, rather than as a diagnosis in its own right.

The neck achieves its wide range of movement through a balance of paired muscles, ligaments and finely shaped joints, and the topmost segments of the cervical spine, the atlas and the axis, are specialised for rotation. Anything that disturbs this balance, whether a tight muscle on one side, a joint that has caught in a rotated position, inflammation that provokes protective spasm, or abnormal nerve signals driving the muscles, can pull the head off centre and produce the recognisable wry-neck appearance.

Because so many different processes converge on the same final posture, the central task in understanding torticollis is to work out which of them is responsible in a given person. The forms differ enormously in their age of onset, their cause, their natural course and their implications, and grouping them under one heading is useful only as a starting point. The sections that follow set out the principal forms in turn.

Congenital muscular torticollis: the commonest form in babies

Congenital muscular torticollis is the most frequent cause of a wry neck in infancy. It arises from shortening and tightness of the sternocleidomastoid muscle on one side of the neck, the long strap muscle that runs from behind the ear down to the collarbone and breastbone. When this muscle is tight on one side, it tilts the head towards that side and turns the chin towards the opposite shoulder, producing the characteristic posture.

The reported incidence varies, with most estimates falling below one to two per cent of live births, and the condition is described as somewhat more common in boys and more often affecting the right side. A range of factors around birth has been associated with it, including breech presentation, a first pregnancy, a large baby, and crowding of the baby within the womb, all of which point towards intrauterine positioning and birth-related pressure on the developing muscle as part of the explanation. In some infants a firm, painless swelling, sometimes called a sternocleidomastoid tumour or pseudotumour, can be felt within the muscle in the early weeks; this is fibrous tissue rather than a true growth and tends to resolve.

Two associations are emphasised in the literature because they are looked for at the time of assessment. The first is deformational plagiocephaly, a flattening of one side of the back of the head, which develops because the baby tends to rest consistently on the same side; facial and jaw asymmetry can accompany it. The second is developmental dysplasia of the hip, reported in a notable minority of affected infants, which is why the hips are examined when congenital muscular torticollis is identified.

The cornerstone of management described in the literature is conservative, centred on physiotherapy. Programmes typically combine gentle stretching of the tight muscle, exercises and positioning to encourage active movement to the opposite side, and education of caregivers, who deliver much of the day-to-day handling. The evidence consistently links earlier diagnosis and the start of treatment before around three months of age with the best results, and large series report excellent outcomes in the great majority of infants treated this way. Where a palpable mass or marked muscle change is present, ultrasound is the imaging most often used, both to characterise the muscle and to follow it over time. A small proportion of children whose tightness persists despite sustained conservative treatment, or who present late with established restriction, are described in the literature as candidates for surgical release or lengthening of the muscle, an intervention whose timing and outcomes remain a subject of discussion.

Acquired torticollis in children: common causes and important exceptions

When a wry neck appears in a child who previously held the head normally, the term acquired torticollis is used, and the range of underlying causes is wide. The reassuring majority are benign and short-lived. Minor strain or inflammation of the neck muscles, a viral upper respiratory illness, a sore throat from streptococcal infection, and inflammation of the lymph nodes in the neck are among the commonest triggers, and the resulting posture often settles as the underlying irritation resolves.

A distinct and frequent cause in childhood is rotation of the atlas on the axis that becomes temporarily fixed, considered separately below. Beyond these, the literature is careful to note a small but important set of serious causes that account for a minority of cases. These include injury to the cervical spine, a collection of pus behind the throat known as a retropharyngeal abscess, and, importantly from the point of view of structural disease, tumours of the posterior fossa at the base of the brain or of the cervical spinal cord. Several case series describe acquired torticollis as occasionally being the first and even the only outward sign of such a lesion before other features develop.

For this reason the literature describes certain accompanying features as warranting careful evaluation, including a torticollis that is persistent, that does not fit a simple muscular or infective explanation, or that is joined by symptoms such as morning headache, vomiting, unsteadiness, abnormal eye movements or other neurological changes. The recognised pattern of new-onset torticollis together with such features is widely treated in the literature as an indication for brain and spinal imaging, precisely because a structural cause must be excluded. This is the point at which a sign that is usually trivial intersects with the concerns of spinal and neurological practice.

Atlantoaxial rotatory subluxation and fixation, and the Fielding classification

The topmost two vertebrae, the atlas (C1) and the axis (C2), form a highly mobile joint responsible for much of the rotation of the head. In children especially, this joint can become rotated and then catch in that position, a condition termed atlantoaxial rotatory subluxation, and when it remains fixed, atlantoaxial rotatory fixation. The child holds the head in the typical "cock-robin" posture, tilted to one side and rotated to the other, and finds it difficult or painful to turn the head back towards the midline. It may follow a minor injury, an upper respiratory infection or surgery in the head and neck region, or arise without any clear trigger.

The classification most widely used was set out by Fielding and Hawkins in 1977 and divides the displacement into four types according to the position of the atlas relative to the axis. Type I, the most common and most benign, is rotation without any forward slippage of the atlas. Type II is rotation accompanied by a few millimetres of forward displacement. Type III involves rotation with greater forward displacement, and Type IV, the rarest,

involves rotation with backward displacement of the atlas. The higher-numbered types reflect greater displacement and a greater concern for the integrity of the ligaments that normally hold these vertebrae in alignment.

The imaging used to confirm and characterise the problem is described in the literature as centring on computed tomography, including dynamic studies that capture the joint in different positions and three-dimensional reconstructions, which together show the rotated relationship that plain films can miss. Magnetic resonance imaging is used where ligamentous injury or compression of the spinal cord needs to be assessed, since it shows the soft tissues that computed tomography does not. The literature describes management as graded according to type and duration: many cases, particularly those of recent onset, resolve with rest, a collar and a course of traction, while more established or recurrent fixation may call for halo immobilisation, and a small minority that do not reduce or that show instability are described as candidates for surgical stabilisation and fusion of the C1–C2 segment.

Grisel's syndrome: torticollis after infection or head and neck surgery

A particular variant of non-traumatic atlantoaxial rotatory subluxation is known as Grisel's syndrome. Here the rotation and fixation of the atlas on the axis follow an infection of the head and neck region, or an operation in that area, rather than an injury. Recognised associations described in the literature include throat and nasopharyngeal infections, inflamed or abscessed tonsils, ear infections, and procedures such as tonsillectomy, adenoidectomy and other operations around the upper airway.

The mechanism most often cited involves the spread of inflammation from the back of the throat to the ligaments around the upper cervical joint. Anatomical work has described a network of small veins connecting the posterior pharynx to the region around the odontoid peg, providing a route by which inflammatory material may reach these structures and produce laxity of the ligaments that normally stabilise the joint. Associated spasm of the deep neck muscles is described as contributing to the fixed twisted posture. The condition presents as a painful torticollis in the aftermath of the infection or operation, and the literature stresses early recognition, since prompt management is described as reducing the risk of lasting deformity or, rarely, neurological consequences. Assessment and management broadly follow those of atlantoaxial rotatory fixation, with the addition of treating the underlying infection.

When torticollis signals a structural cervical problem

Most torticollis is muscular, postural or self-limiting, and the role of the spinal surgeon in these forms is limited. The importance of structural assessment lies in the subset of presentations where the twisted neck is the outward sign of an underlying problem of the bones, joints, ligaments or contents of the cervical spine.

Several structural entities are described in this context. Atlantoaxial rotatory fixation and Grisel's syndrome, set out above, are themselves structural problems of the C1–C2 joint. Congenital anomalies of the upper cervical spine are also relevant: os odontoideum, in which the tip of the odontoid peg of the axis is a separate piece of bone rather than fused to its base, and Klippel-Feil syndrome, in which cervical vertebrae are congenitally fused, are both associated with abnormal posture and, importantly, with instability of the upper cervical spine that may become apparent after seemingly minor stress. These anomalies are sometimes found alongside one another and alongside other syndromes. Tumours of the cervical spinal cord and of the posterior fossa, already mentioned among the serious causes of acquired torticollis, complete the picture of structural causes that a spinal or neurosurgical assessment is designed to identify or exclude.

The literature frames the spinal-surgical contribution as one of distinguishing the common benign forms from these structural ones through history, examination and, where indicated, imaging, and of managing the structural causes when they are found. This may involve stabilising an unstable upper cervical segment, addressing a congenital anomaly that threatens the spinal cord, or working alongside other specialists where a tumour or infection is responsible. The thread running through this part of the subject is that torticollis is occasionally a window onto the cervical spine, and that recognising when it is, rather than when it is simply a tight muscle or a

passing spasm, is the central judgement.

Adult spasmodic torticollis and cervical dystonia

In adults, the commonest cause of a persistent abnormal neck posture is cervical dystonia, historically called spasmodic torticollis. This is a neurological movement disorder in which the muscles of the neck contract involuntarily, pulling the head into abnormal positions and often producing tremor of the neck and pain. It is one of the most frequent of the focal dystonias, disorders in which involuntary muscle contraction is confined to one region of the body, and population studies place its prevalence at roughly five to ten people per hundred thousand, with a consistent predominance in women.

Cervical dystonia is fundamentally different from the muscular and mechanical forms discussed earlier. Its origin is understood not as a problem of the muscle, joint or bone, but as a disorder of the brain networks that control movement. The literature describes it as a network disorder involving the basal ganglia deep within the brain together with the thalamus, the sensorimotor cortex and the cerebellum, rather than a fault confined to any single structure. In most cases no specific cause is identified, and it is termed idiopathic, though genetic factors and previous trauma are discussed as contributors in some.

The pattern of pull varies between people, and a descriptive classification is used. The older scheme named the directions of movement: torticollis for rotation, laterocollis for sideways tilt, retrocollis for backward extension and anterocollis for forward flexion, with rotation the most common and anterocollis the least. A more recent refinement, the collum-caput (Col-Cap) concept, distinguishes movements of the head on the upper neck from movements of the whole neck, because the muscles responsible differ, and identifying them accurately matters for targeted treatment. The standard tool for grading severity in research and practice is the Toronto Western Spasmodic Torticollis Rating Scale.

The treatment most strongly supported by the evidence is injection of botulinum toxin into the overactive neck muscles, which weakens them selectively and eases the abnormal posture, the tremor and the pain for a period of months before the injections are repeated. Professional guidelines classify this as a first-line, well-evidenced treatment, and reported series describe meaningful improvement in posture, range of movement and pain in a majority of those treated. Oral medication is described as a sometimes useful adjunct with modest effect and limiting side effects. For the minority whose condition does not respond adequately, surgical options are described, principally deep brain stimulation directed at the globus pallidus and selective peripheral denervation of the overactive neck muscles, both reported to reduce severity scores, sometimes used together. These are the forms of torticollis in which a movement-disorder neurologist usually leads, with the spinal team contributing where secondary changes in the cervical spine arise.

Assessment and imaging in principle

The assessment of torticollis described in the literature begins with distinguishing which form is present, since age of onset, the way the posture began, its course over time and the accompanying features point towards very different explanations. A wry neck present from birth points towards the congenital muscular form; one that appears in an older child after a sore throat or minor injury points towards the acquired causes and the C1–C2 joint; one that develops gradually in an adult with involuntary spasm and tremor points towards cervical dystonia.

Examination characterises the posture itself, the state of the sternocleidomastoid and other neck muscles, the range of neck movement, and any neurological features, while in infants the head shape and the hips are assessed alongside the neck. Imaging is selected according to what is suspected rather than applied uniformly. Ultrasound is described as the usual choice for examining the sternocleidomastoid muscle in babies. Computed tomography, including dynamic and three-dimensional studies, is described as the imaging of choice for atlantoaxial rotatory fixation. Magnetic resonance imaging is described for assessing the soft tissues, the ligaments, the spinal cord and the brain, and is the modality emphasised where a tumour of the posterior fossa or cervical cord must be excluded in a child with unexplained or persistent acquired torticollis. The principle running through the literature is that imaging is directed by the clinical picture, and that its main purpose in the structural context is to confirm a benign mechanical explanation or to identify the uncommon serious one.

Management in principle

Across its forms, the management of torticollis described in the literature follows the cause rather than the posture. For congenital muscular torticollis, conservative physiotherapy with stretching, positioning and caregiver education is the mainstay, begun early for the best results, with surgical release reserved for the persistent or late-presenting minority. For benign acquired torticollis in children, treatment of the underlying irritation and time are usually sufficient. For atlantoaxial rotatory fixation and Grisel's syndrome, the graded approach runs from rest, a collar and traction through halo immobilisation to surgical stabilisation in the resistant or unstable minority, with treatment of any underlying infection in Grisel's syndrome. For cervical dystonia in adults, botulinum toxin injection is the first-line, best-evidenced treatment, with oral medication as an adjunct and deep brain stimulation or selective denervation reserved for refractory cases.

The structural causes, the upper cervical anomalies, instability and tumours, are managed by the relevant surgical and oncological teams according to the specific problem, and it is here that the spinal surgeon's contribution is most direct, whether in stabilising an unstable segment or addressing an anomaly that threatens the spinal cord. The literature is consistent that the evidence base differs markedly between these forms, being strongest for botulinum toxin in cervical dystonia and for early physiotherapy in congenital muscular torticollis, and resting more heavily on case series for the rarer structural conditions. Throughout, the descriptions emphasise that decisions are individualised and made by the treating team within a framework of shared decision-making rather than fixed rules.

Outlook

The outlook in torticollis is, for the great majority, favourable, and it tracks closely with which form is present. Congenital muscular torticollis treated early with physiotherapy resolves in the large majority of infants, and most benign acquired torticollis in children settles as the underlying trigger passes. Atlantoaxial rotatory fixation, particularly of recent onset, commonly reduces with conservative measures, though established or recurrent cases are more troublesome and a small number require surgery. Grisel's syndrome generally does well when recognised and treated promptly.

Cervical dystonia in adults follows a different course: it tends to be a long-term condition rather than a self-limiting one, but botulinum toxin treatment controls the posture, tremor and pain effectively in most, and further options exist for those it does not. The concern across the whole subject lies with the uncommon structural and serious causes, the upper cervical instability and the tumours, where the outlook depends entirely on the specific underlying problem and on its timely recognition. The consistent themes across the literature are that torticollis is usually benign and self-limiting, that its many forms differ greatly in cause and course, that the central task is to identify the small structural minority, and that any individual outlook is a matter for assessment by the treating team rather than something that can be read from the posture alone.