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ORTHOPAEDIC FORUM

The Osborne-Cotterill Lesion

How an Eponymous Term Arose and Evolved

Matthijs P. Somford, MD, PhD, Michel P.J. van den Bekerom, MD, PhD, Taco Gosens, MD, PhD, and Frank F.A. IJpma, MD, PhD

Eponymous terms are derived from a person's name. They are used regularly in daily practice and in the literature¹⁻³. Although eponymous terms have their limitations, they provide an easy shorthand and often are preferred over anatomical description or classification⁴.

The eponymous term *Osborne-Cotterill lesion* was introduced in the field of elbow surgery in 2008⁵. However, the origin of this eponymous term dates farther back. Geoffrey Osborne (1918 to 2005), an orthopaedic surgeon at the Liverpool Royal and Southport Infirmaries, and Paul Cotterill, an orthopaedic surgeon at the Royal Orthopaedic Hospital in Birmingham, wrote a seminal paper in the British volume of *The Journal of Bone & Joint Surgery* about recurrent dislocation of the elbow in 1966⁶. They described the pathophysiology of recurrent dislocation of the elbow and proposed a new treatment strategy, which consisted of a soft-tissue repair of the posterolateral capsule.

The work performed by Osborne and Cotterill more than half a century ago is of great relevance for surgeons who are involved in the treatment of elbow instability today. To commemorate the original work of Osborne and Cotterill, and following the tenth anniversary of the eponym that emerged from their work, we analyzed the evolution of the term *Osborne-Cotterill lesion*. The aim of this study was to assess how this eponymous term arose, evolved, perhaps changed, and found its way into the medical literature over time.

Materials and Methods

First, we identified the original article that had been written by Osborne and Cotterill. The original paper, which had been published in the British volume of *The Journal of Bone* & *Joint Surgery* in 1966, was analyzed to obtain the exact description of the lesion that eventually became eponymous. Beginning with the original publication, we traced all of the key papers on elbow instability over the last decades. By filing the papers in chronological order, we identified the article in which the eponymous term *Osborne-Cotterill lesion* was introduced. In 2008, the *American Journal of Roentgenology* published the "Osborne-Cotterill Lesion: An Osseous Defect of the Capitellum Associated with Instability of the Elbow" by Jeon et al.⁵.

In the next phase, we tried to evaluate if and how the meaning of the eponym evolved over time. We used the PubMed Central repository "cited by" feature to identify all of the articles that cited the original article. Secondly, we performed an unlimited PubMed search by using the term "Osborne Cotterill," and we identified all of the articles that had reported on the eponymous term (see Appendix). Inclusion criteria included referencing of the original paper by Osborne and Cotterill or mention of the eponymous term Osborne-Cotterill lesion. The exclusion criterion was a lack of discussion regarding the properties of the lesion that is encountered in elbow instability.

We analyzed all of the articles that had been retrieved with our search strategy to identify whether they contained a description of the eponymous term that was similar to or divergent from the original description of the eponymous term by Jeon et al.: "osseous lesion associated with recurrent elbow dislocation." Divergent does not mean "wrong," but it is an

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indication that the description in an article differed from the original description. Also, we compared all descriptions of the lesion over time to the description that had been given in the original article. The focus was solely on the anatomical description of the lesion that is encountered with elbow instability or on the definition of an Osborne-Cotterill lesion that was used in each of the articles. The proposed etiology, treatment, and manner of diagnosis were not analyzed.

Results

Original Osborne and Cotterill Article

In their original paper on recurrent elbow dislocation, Osborne and Cotterill established some common features in the cases that they presented. They stated that "recurrent dislocation of the elbow is caused primarily by collateral ligament laxity with secondary damage to the capitellum and head of radius." They carefully observed that the osteochondral injury of the capitellum was located posterolaterally. In cases of recurrent elbow dislocation, they correlated the lesion of the capitellum and the radial head to a commonly seen impaction fracture of the humeral head and the anterior aspect of the glenoid with recurrent shoulder dislocation, known as the Hill-Sachs lesion. Although Osborne and Cotterill pointed out the resemblance between these 2 entities, they did not refer to the shoulder lesion as a Hill-Sachs lesion nor reference the original article from 1940.

Radiographic images from the original Osborne and Cotterill paper demonstrate that as the radial head displaces backward, its edge scrapes over the posterior or lateral margin of the capitellum (Fig. 1). The authors included a schematic representation of pathological features that may be found in recurrent dislocation of the elbow (Fig. 2). They also proposed a new surgical technique for the treatment of recurrent elbow dislocation that consisted of a posterolateral capsular repair (Fig. 3). At the time the paper was published in 1966, 8 patients had been treated successfully with the described method.

The Introduction of the Eponymous Term

During our PubMed search on elbow instability, we identified the Jeon et al. article from 2008 in which the authors stated that they had "termed the lesion Osborne-Cotterill lesion." They defined the Osborne-Cotterill lesion as "an osseous defect of the posterolateral corner of the capitellum [which] is an uncommon finding that in each instance was associated with chronic posterolateral rotatory instability of the elbow." 5 Since 2008, the eponymous term has been used in the medical literature. Jeon et al. referred to the original 1966 Osborne and Cotterill paper at the time that they launched the eponymous term with the aforementioned description. Because this is the description that became eponymous, we considered recurrent dislocation of the elbow together with "damage to the capitellum," as defined by Jeon et al., to be descriptive for the Osborne-Cotterill lesion. It should be noted that the proposed definition of the eponymous term does not refer to the radial head fracture and collateral ligament laxity as was originally described by Osborne and Cotterill.

Chronological Literature Review

In a literature review and a case presentation in 1967, Devadoss mentioned the original Osborne and Cotterill article, and they referred to the recurrent nature of the instability as reported by Osborne and Cotterill⁸. In 1967, Madgwick cited the original article in order to describe the ligamentous repair that was done in a case with elbow instability9. In 2 papers in 1976 and 1977, Dürig et al. presented a case series of 4 patients with recurrent dislocation of the elbow; they reported the same lesions that had been described in the original article by Osborne and Cotterill^{10,11}. In 1982, Zeier wrote a case report about a child with recurrent elbow dislocation in which the lateral collateral band was rendered irreparable with the surgical technique of Osborne and Cotterill¹². In 1985, Fontaine et al. described a case series of 9 patients with recurrent dislocation of the elbow¹³. In their article, the names of Osborne and Cotterill were related to the surgical technique for repairing the lateral

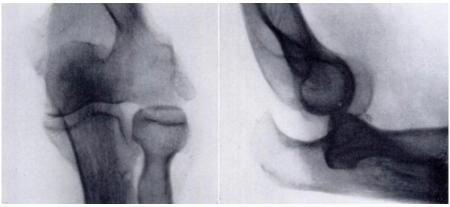


Fig. 1
Radiographs showing recurrent dislocation of the elbow associated with a posterolateral osteochondral fracture of the capitellum and a marginal defect of the radial head. (Reproduced, with permission of the Licensor through PLSclear, from: Osborne G, Cotterill P. Recurrent dislocation of the elbow. J Bone Joint Surg Br. 1966 May;48[2]:340-6. Copyright © 1966, The British Editorial Society of Bone and Joint Surgery: All rights reserved.)

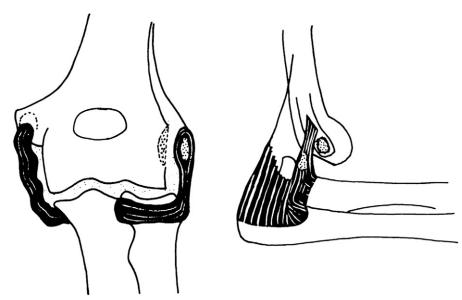


Fig. 2
Illustration from the original Osborne and Cotterill (1966) paper that represents the etiology of recurrent elbow dislocation. The anteroposterior view of the elbow (left) shows "some laxity of the medial band" and "incomplete healing of the lateral ligament and posterolateral capsule with an ununited lateral fragment." The lateral view of the elbow (right) demonstrates an osteochondral defect in the posterolateral margin of the capitellum. (Reproduced, with permission of the Licensor through PLSclear, from: Osborne G, Cotterill P. Recurrent dislocation of the elbow. J Bone Joint Surg Br. 1966 May;48[2]: 340-6. Copyright © 1966, The British Editorial Society of Bone and Joint Surgery: All rights reserved.)

band. In 1989, Nickels and Mommens presented another case series in which they posited that "surgical repair using the Osborne and Cotterill technique seems to give the best results." In 2008, Azam et al. cited the original article in relation to the discussed surgical repair. 5

The article by Jeon et al. that was published in the *American Journal of Roentgenology* in 2008 should be considered the landmark paper in which the eponymous term *Osborne*-

Cotterill lesion was introduced⁵. Jeon et al. defined the lesion correctly in a case series of 4 patients with recurrent elbow dislocation. Their motivation to name this condition an "Osborne-Cotterill lesion" was based on recognition of the authors who first described this lesion. In 2009, Matsunaga et al. referenced the original article in their introduction, only to note that a capitellar fracture can be present in the case of a proximal radial fracture¹⁶. In 2010, Muller et al. referred to the

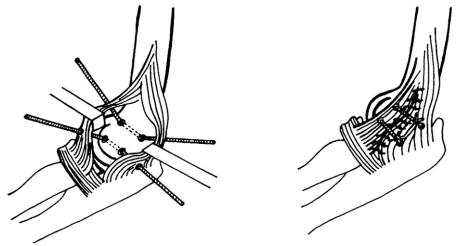


Fig. 3
Surgical treatment of recurrent elbow dislocation as proposed by Osborne and Cotterill in 1966. They performed a repair of the posterolateral capsule by passing catgut sutures through drill-holes in order to tie the capsule down to the bone. (Reproduced, with permission of the Licensor through PLSclear, from: Osborne G, Cotterill P. Recurrent dislocation of the elbow. J Bone Joint Surg Br. 1966 May;48[2]:340-6. Copyright © 1966, The British Editorial Society of Bone and Joint Surgery: All rights reserved.)

Osborne and Cotteriil ⁹	Author	Journal	Year	Definition of the Osborne-Cotterill Lesion (as Given in This Article)	Compared with the Original Article ⁶ (1966)	Compared with the Definition by Jeon et al. (2008)
Madgwick ⁹ Proc R Soc Med 1967 Not stated Durig et al. ¹⁰ Arch Orthop Unfallchir Durig et al. ¹¹ Chirurg 1977 Instability of the posterolateral ligaments with intra-articular osteochondral fractures Res Ciln Orthop Relat Res Coltro Orthop Res Res Coltro Orthop Relat Res Coltro Orthop Res Res Coltro Orthop Res Reparatrice Appar Mot Mommens Acta Orthop Belg Disord BMC Musculoskelet Disord Disord Disord Disord Disord Disord Disord Disord Azam et al. ²⁰ AR m J Roentgenol Azam et al. ²⁰ Al Ram J Roentgenol Coltro Coltro Coltro Al Res And N H Roentgenol Coltro Coltro	Osborne and	J Bone Joint Surg Br		Recurrent dislocation of the elbow is caused primarily by collateral ligament laxity with secondary damage to the capitellum and head	(3223)	Divergent
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Horlohé et al. ²¹ avulsions at the dorsoradial aspect of the distal humerus	Fujimori et al. ²⁰	J Med Case Rep	2012	ligament with a nonunited lateral	Similar	Divergent
Englert et al. 22 Adv Orthon 2013 Not stated		Int Orthop	2013	avulsions at the dorsoradial aspect	Similar	Divergent
Inglate of all. National Page 2010 Not outlood	Englert et al. ²²	Adv Orthop	2013	Not stated		

Author	Journal	Year	Definition of the Osborne-Cotterill Lesion (as Given in This Article)	Compared with the Original Article ⁶ (1966)	Compared wit the Definition by Jeon et al. (2008)
Pike et al. ²³	Clin Orthop Relat Res	2014	An impaction fracture of the posterior capitellum	Similar	Similar
Karuppiah and Knox ²⁴	Case Rep Orthop	2014	Not stated		
Hackl et al. ²⁵	Dtsch Arztebl Int	2015	Not stated		
Rhyou et al. ²⁶	Clin Orthop Relat Res	2017	Lateral (posterior capitellar) bone contusion that may be caused mainly by impingement of the radial head into the posterior capitellum during forced forearm external rotation	Similar	Similar
Robinson et al. ²⁷	Shoulder Elbow	2017	Not stated		
Schwarzkopf et al. ²⁸	J Shoulder Elbow Surg	2018	An osteochondral fracture in the posterolateral margin of the humeral capitellum with or without a crater or shovel-like defect in the radial head	Similar	Similar

original article and noted that the function and importance of ligamentous structures are controversial¹⁷. In 2011, Capo et al. described a pediatric case and stated that it might have been a pediatric Osborne-Cotterill lesion¹⁸; they referred to both the original article and the article by Jeon et al. According to Capo et al., Osborne and Cotterill did not mention the associated lateral collateral ligament damage. Interestingly, the ligamentous lesion had been discussed in the original paper; however, it had not been included in the description given by Jeon et al., where the authors erroneously state that Osborne and Cotterill did not mention the ligamentous injury^{5,6}.

In 2011, Jeon et al. presented a second case series about posterolateral rotatory instability of the elbow¹⁹. In 2012, Fujimori et al. referred to the statement by Osborne and Cotterill that a pocket in the lateral collateral ligament in association with a nonunited lateral epicondylar fragment could cause recurrent elbow dislocation and instability²⁰. In 2013, Schmidt-Horlohé et al., in a case series with computed tomographic examinations of the elbow, indicated that they categorized osseous ligamentocapsular avulsions at the dorsoradial aspect of the distal portion of the humerus as Osborne-Cotterill lesions²¹. In 2013, Englert et al. cited the original article in relation to a method of ligamentous repair in a case of recurrent dislocation of the elbow²².

In 2014, Pike et al. considered the presence of a fracture of the posterior aspect of the capitellum as evidence for the occurrence of a posterior dislocation of the elbow²³. In 2014, Karuppiah and Knox reported a case of radioulnar fracture-dislocation with an avulsion injury of the triceps, but this pattern was in accordance with the original publication by

Osborne and Cotterill²⁴. In 2015, Hackl et al. presented a systematic review about elbow dislocations²⁵. The citation by Rhyou et al. in 2017 was marked "similar," although they mentioned a bone bruise of the capitellum instead of damage to the osteochondral surface²⁶. The depicted region was considered a match, and "similar" was used because Osborne and Cotterill did not have magnetic resonance imaging and thus could not have recognized a bone bruise. In 2017, Robinson et al. cited the original Osborne and Cotterill article in relation to trauma mechanisms that cause posterior elbow dislocation²⁷. In 2018, Schwarzkopf et al. reported on the operative treatment of a patient with an Osborne-Cotterill lesion, which was associated with a Mason type-4 radial head elbow dislocation-fracture²⁸.

How the Osborne-Cotterill Lesion Was Defined in Each of the Articles

Of the 24 eligible articles that we reviewed, 9 (38%) did not provide a description of an Osborne-Cotterill lesion (Table I). However, we did include these articles in our review because they cited the original paper by Osborne and Cotterill. The remaining 15 articles used a description that was "similar" to the original description by Osborne and Cotterill in 1966. Three of these 15 papers, including the original article by Osborne and Cotterill, used a description that was divergent from the description of the eponymous term as coined by Jeon et al. in 2008⁵. We divided the results into 2 time frames (before and after the introduction of the eponymous term in 2008) in order to analyze the impact that an eponymous term has. From 1966 until 2008, 9 articles (0.2 articles per year) with the eponymous

THE OSBORNE-COTTERILL LESION

Identified Articles	Total = 24
Articles providing description of an Osborne and Cotterill lesion	15 (63%)
Articles with a similar description to Osborne and Cotterill	15 (100%)
Articles with a similar description to Jeon et al.	12 (80%)
Articles from 1966 to 2008	9 (0.2/yr)
Articles from 1966 to 2008 providing a description of an Osborne and Cotterill lesion	6 (67%)
Articles from 1966 to 2008 with a similar description to Osborne and Cotterill and Jeon et al.	6 (100%)
Articles from 2008 to 2018	13 (1.3/yr)
Articles from 2008 to 2018 providing a description of an Osborne and Cotterill lesion	8 (62%)
Articles from 2008 to 2018 with a similar description to Osborne and Cotterill and Jeon et al.	6 (75%)

term were found, and from 2008 onward, 13 articles (1.3 articles per year) were found. From 1966 until 2008, 5 (56%) of 9 articles gave a description, and all (100%) of the descriptions mentioned were similar to those in the articles by Osborne and Cotterill⁶ and by Jeon et al.⁵. After the introduction of the eponymous term, 8 (62%) of 13 articles described the lesion. Six (75%) of these 8 articles had descriptions that were similar to those in the articles by Osborne and Cotterill and Jeon et al. (Table II).

Discussion

More than half a century ago, Geoffrey Osborne and Paul Cotterill published a landmark paper about recurrent elbow dislocation⁶. Their pioneering work eventually led to a new eponymous term, the Osborne-Cotterill lesion, which was introduced in 2008. It took almost 5 decades until the eponymous term found its way into the medical literature⁵. Thirty-eight percent of the articles in our search did not provide a definition of the Osborne-Cotterill lesion. Also, the detail and length of the descriptions varied substantially. The actual coining of the eponymous term in 2008 did not seem to have an influence on the description of the lesion in the literature. Whereas an eponymous term is presumed to help in communication but can sometimes obscure the original meaning, this is not the case with the Osborne-Cotterill lesion. In fact, all of the remaining articles were in line with the original publication of Osborne and Cotterill⁶, whereas some papers provided definitions that differed from the meaning of the eponymous term as proposed by Jeon et al⁵.

The papers from the 1970s, 1980s, and 1990s focused on the posterolateral capsular repair with catgut sutures passing through drill-holes in order to tie the capsule down to the bone, as has been introduced in the original paper by Osborne and Cotterill¹⁰⁻¹⁴ (Fig. 3). Only Zeier, in 1982, had to rely on an alternative technique to reconstruct the damaged lateral ligaments in a 14-year-old boy with an Osborne-Cotterill lesion by using tendinous fascia lata autograft strips¹². All of the other authors were delighted about this innovative operative technique that had been proposed by Osborne and Cotterill. Throughout all of these years, the names of Osborne and Cotterill mainly were related to the operative repair rather than

the ligamentous and osseous injuries that are associated with recurrent elbow dislocation. It seems that over time, the interest regarding the original work of Osborne and Cotterill gradually evolved from the surgical repair technique to the anatomical features and radiographic findings without changing the essence of the reported findings.

Jeon et al. defined the Osborne-Cotterill lesion as "an osseous defect of the capitellum associated with instability of the elbow."5 However, they assigned the term Osborne-Cotterill lesion to the capitellar defect and they made an explicit comment that Osborne and Cotterill did not recognize the essential ligamentous pathology involving the lateral ulnar collateral ligament. Actually, the opposite is true: Osborne and Cotterill did pay appropriate attention to the ligamentous etiology of recurrent elbow dislocation (Fig. 2). If we refer to the 1966 article, Osborne and Cotterill noted that "recurrent dislocation of the elbow is caused primarily by collateral ligament laxity with secondary damage to the capitellum and head of radius." In this original definition, the importance of the ligamentous injury is indeed taken into account. If we compare the original definition to that of Jeon et al. in 2008, we can conclude that the description was slightly changed, with attention paid to the concomitant ligamentous and radial head injuries. Therefore, we suggest redefining the Osborne-Cotterill lesion by restricting its use to the original definition as posed by Geoffrey Osborne and Paul Cotterill. Overall, the eponymous term is mostly used correctly according to the original 1966 description, making it a reliable eponymous term to date. When using eponymous terms in scholarly publications, it is incumbent on authors to retrieve the original and subsequent published descriptions of the condition and to cite them correctly in order to prevent "drift" of the description.

In summary, we hope that the eponymous term *Osborne-Cotterill lesion* will be used in conformity with the original description: "recurrent dislocation of the elbow is caused primarily by collateral ligament laxity with secondary damage to the capitellum and head of radius." The notion of collateral ligament laxity concomitant with the often more obvious capitellar and radial head injury is of particular importance.

THE JOURNAL OF BONE & JOINT SURGERY • JBJS.ORG VOLUME 101-A • NUMBER 16 • AUGUST 21, 2019 THE OSBORNE-COTTERILL LESION

Appendix

Supporting material provided by the authors is posted with the online version of this article as a data supplement at jbjs.org (http://links.lww.com/JBJS/F328).

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