

Accuracy of internet images of glenoid labral injuries

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ABSTRACT

INTRODUCTION The internet is a convenient source of health information used widely by patients and doctors. Previous studies have found that the written information provided was often inaccurate. There is no literature regarding the accuracy of medical images on the internet. The aim of this study was to assess the accuracy of internet images of injuries to the glenoid labrum following shoulder dislocation.

METHODS The Google and Bing search engines were used to find images of Bankart, Perthes and anterior labroligamentous periosteal sleeve avulsion (ALPSA) lesions. Three independent reviewers assessed the accuracy of image labelling.

RESULTS Of images labelled 'Bankart lesion', 30% (9/30) were incorrect while 'Perthes lesion' images were incorrect in 15% of cases (9/60) and 4% of 'ALPSA lesion' images were incorrect (2/46). There was good interobserver reliability ($\kappa = 0.81$). Labelling accuracy was better on educational sites than on commercial sites (6% vs 25% inaccurate, $p=0.0013$).

CONCLUSIONS Caution is recommended when interpreting non-peer reviewed images on the internet.

KEYWORDS

Internet – Search engine – Shoulder – joint instability

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Both patients and doctors use the internet as a source of free, up-to-date written information in an easily accessible format.¹ The internet can be a useful tool for patient education; patients who are better informed have better health outcomes and better patient–doctor relationships.²

Caution is needed, however. Written internet data are seldom peer reviewed and often inaccurate. For instance, inaccurate data have been reported in 50% of 121 websites concerning 5 common health issues.³ Another survey of 1,500 websites related to paediatric health issues found 59% provided inaccurate information.⁴ Consumers of internet health information need to appraise the data critically; often the data need to be discarded.⁵

The accuracy of internet images has not yet been documented in the literature. Internet images are attractive as they convey complex information in a simple format. Surgeons use such illustrations frequently for their own education and to demonstrate the diagnosis to patients in a clinic setting. Similarly, patients often prepare for a consultation by researching such images on the internet. Recent evidence suggests that at least 50% of orthopaedic outpatients have researched their condition online prior to their initial consultation.⁶

The incidence of traumatic shoulder instability in the general population is 1.7%.⁷ Such instability can result in Bankart, Perthes or anterior labroligamentous periosteal

sleeve avulsion (ALPSA) lesions. It is important to differentiate between these anatomical lesions as they have different postsurgical failure rates.^{8,9} Recurrence rates for ALPSA lesions (15.4%) have been shown to be twice that of Bankart lesions (7.1%).¹⁰ Revision surgery for instability carries high

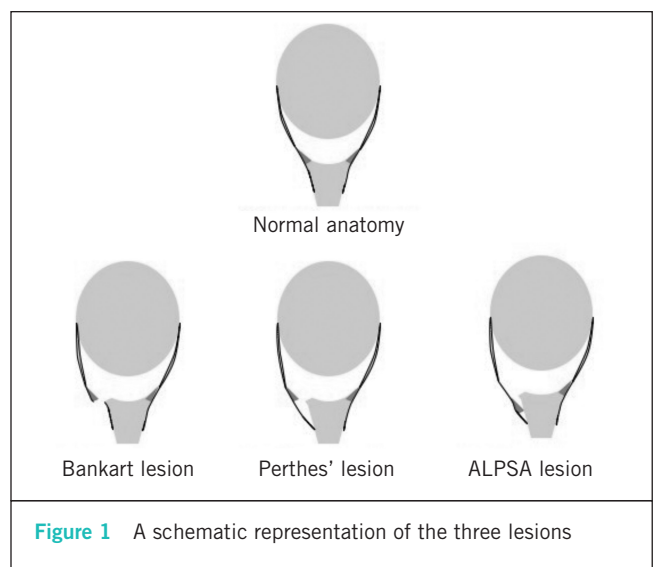


Table 1 Results of labelling accuracy for Bankart lesions by site type

Search engine	Accuracy	Commercial	Educational	Individual	Total
Google	Correct	8	11	1	20
	Incorrect	7	2	0	9
Bing	Correct	9	13	0	22
	Incorrect	7	0	0	7
Total		31	26	1	58

Table 2 Results of labelling accuracy for Perthes lesions by site type

Search engine	Accuracy	Commercial	Educational	Individual	Total
Google	Correct	15	34	1	50
	Incorrect	6	2	1	9
Bing	Correct	12	33	0	45
	Incorrect	0	0	0	0
Total		33	69	2	104

Table 3 Results of labelling accuracy for anterior labroligamentous periosteal sleeve avulsion lesions by site type

Search engine	Accuracy	Commercial	Educational	Individual	Total
Google	Correct	12	29	3	44
	Incorrect	1	1	0	2
Bing	Correct	13	31	1	45
	Incorrect	0	0	0	0
Total		26	61	4	91

failure rates in most series.^{11,12} The aim of this study was to assess the accuracy of images on the internet by viewing schematic and radiological images of these anatomical lesions.

Methods

The following definitions (displayed schematically in Fig 1) were used in this study:

Bankart lesion: Avulsion of the anteroinferior glenoid labrum with its attachment to the inferior glenohumeral ligament complex.¹⁵ The point of failure is between the labrum and the scapular periosteum.

Perthes lesion: A variant of the Bankart lesion where the scapular periosteum remains intact but is stripped medially and the anterior labrum is avulsed from the glenoid but remains partially attached to the scapula by intact periosteum.^{14,15}

ALPSA lesion: The anterior scapular periosteum remains intact and (together with the anterior inferior glenohumeral ligament and labrum) is stripped from the glenoid neck, becoming displaced medially as well as rotating inferiorly.¹⁶

Study design

We reviewed images (both schematic and radiological) of Perthes, ALPSA and Bankart lesions on the inter-

net as a snapshot using the two most popular search engines: Google (<http://www.google.co.uk/images/>), which receives 900 million hits per month, and Bing (<http://www.bing.com/images/>), which receives 165 million hits per month.¹⁷ The search was conducted using the terms ‘Bankart lesion shoulder’, ‘ALPSA lesion shoulder’ and ‘Perthes lesion shoulder’. The first 100 images were reviewed. The results were analysed independently by two trauma and orthopaedic trainees (RF and FA) and one radiology trainee (JP), and compared with the original definitions.

The interobserver agreement was assessed on the results from the Google search using Randolph’s free marginal multirater kappa.¹⁸ Where there was disagreement, the majority view prevailed.

Websites were classified as either being primarily commercial, educational or from individual authors. The accuracy of each was assessed. The chi squared test with Yates’s correction was used to assess the difference between website types. Statistical significance was set at $p < 0.05$.

Images not related to the shoulder (eg Perthes disease of the hip) or to the relevant lesions (eg SLAP lesions [superior labral tear from anterior to posterior]) were excluded, as were moving images and images where the relevant anatomy was not demonstrated clearly.

Table 4 Overall results of labelling accuracy by site type

Accuracy	Commercial	Educational	Individual	Total
Correct	69	151	6	226
Incorrect	21	5	1	27
Total	90	156	7	253

Results

There were high levels of interobserver agreement with a free marginal kappa of 0.81 and 84% overall agreement for the Google dataset.

The Google search for Bankart lesions yielded 29 images after exclusions, of which 31% (9/29) were inaccurate. The Bing search yielded 29 images, of which 24% (7/29) were inaccurate (Table 1).

For Perthes lesions, Google yielded 60 images after exclusions, of which 15% (9/60) were inaccurate. Bing yielded 45 images, none of which were inaccurate (Table 2).

For ALPSA lesions, Google yielded 46 images, of which 5% (2/44) were inaccurate. Bing yielded 45 images, none of which were inaccurate (Table 3).

The commercial websites found on Google were significantly less accurate than the educational sites (29% vs 6% inaccurate, $p=0.0014$). There were relatively few individuals' sites and they had a 17% inaccuracy rate. Using Bing, commercial sites were also less accurate than educational sites (17% vs 0% inaccurate, $p<0.0001$) (Table 4).

Discussion

Our study demonstrated that internet images have incorrect labelling of Bankart lesions in 28% of cases. Educational websites were more likely to be accurate than commercial or individuals' sites.

As a result of our findings, we now only view images of orthopaedic pathology on educational websites. We also check each image for accuracy. Only then do we recommend selected images to patients or use them in consultations. This has reduced the number of difficult consultations that commence with the surgeon correcting a patient's misinformation concerning his or her condition.

The reasons for the inaccuracies encountered are not clear. It may be that some authors consider the term 'Bankart lesion' to describe any labral injury associated with shoulder instability. Furthermore, an author presenting an image of the less often recognised Perthes or ALPSA lesion is likely to better discriminate between the various anatomical lesions, leading to fewer cases of mislabelling.

It is worth noting that our study was limited by the fact that it was a snapshot study and did not include all the images available on the internet as it only included the two most popular search engines.¹⁷

Conclusions

The internet remains a useful source of health information. Our study highlights the importance of critically appraising both written information and illustrations of anatomical lesions published on the internet. We recommend using selected illustrations from educational institutions' sites and carefully checking the images selected.

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