

Most Influential Scientific Articles in Dieulafoy's Lesions: A Bibliometric Analysis of the Top 50 Cited Papers

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Introduction

Dieulafoy's lesions are complex, rare, and potentially life-threatening vascular malformations that cause gastrointestinal bleeding [1]. A Dieulafoy's lesion is characterized by the protrusion of a normal blood vessel with a widened diameter, which protrudes into the mucosa [1,2]. Roughly 6.5% of all non-variceal, upper gastrointestinal bleeds are caused by Dieulafoy's lesions [1,2]. Treatment currently consists of endoscopic manipulation using thermal or heat tropes, regional injection-epinephrine, or mechanical banding and hemoclips [1-3]. Identifying the most impactful articles addressing Dieulafoy's lesions can be both beneficial and valuable to patient care and ongoing research endeavors.

Methods

The study design is a bibliometric analysis. In June of 2024, we used ISI Web of Science (v5.11, Thomas Reuter, Philadelphia, Pennsylvania, USA) to search for the following key phrases: "Dieulafoy's Lesion", "Dieulafoy's disease" or "Dieulafoy's ulcer". Search areas included general surgery, gastroenterology, surgical endoscopy, radiology, oncology, and nuclear medi-

cine and imaging. Articles were searched from 1900 to 2024. The articles were ranked based on number of citations. The results were then evaluated to determine articles most clinically relevant to the management of Dieulafoy's lesions. The top 50 articles that met the search criteria were further characterized on the basis of: title, author, citation density, journal of publication, year (and decade) of publication, institution, and country of origin.

Results

A total of 540 articles matched the search criteria. The most influential 50 articles ranged from 29 to 170 in number of citations. The articles were published between 1978 and 2021, and all articles were published in English. The top cited article was the 2010 work by Baxter et al. discussing the current trends in diagnosis and management of Dieulafoy's lesions.

The second most cited article was published in 2000 by Chung et al. and discussed endoscopic methods for bleeding Dieulafoy's lesions. Third on the list was the article by Lee et al. discussing the clinical characteristics of Dieulafoy's lesions (**Table 1**).

Table 1: Most Influential Articles.

Authors	Publication Year	Journal	Citations	Article Title
Baxter M	2010	Annals of the Royal College of Surgeons of England	170	Dieulafoy's Lesion: Current Trends in Diagnosis and Management
Chung Ik	2000	Gastrointestinal Endoscopy	149	Bleeding Dieulafoy's Lesions and The Choice of Endoscopic Method: Comparing the Hemostatic Efficacy of Mechanical and Injection Methods
Lee YT	2003	Gastrointestinal Endoscopy	137	Dieulafoy's Lesion
Yano T	2008	Gastrointestinal Endoscopy	119	Endoscopic Classification of Vascular Lesions of The Small Intestine (With Videos)
Baetig B	1993	Gut	119	Dieulafoys Disease - Endoscopic Treatment and Follow-Up
Reilly HF	1991	Digestive Diseases and Sciences	116	Dieulafoys Lesion - Diagnosis and Management

Stark ME	1992	Gastrointestinal Endoscopy	114	Clinical-Features and Endoscopic Management of Dieulafoys Disease
Dy NM	1995	American Journal of Gastroenterology	104	Bleeding From the Endoscopically-Identified Dieulafoy Lesion of The Proximal Small-Intestine and Colon
Chaer RA	2003	Journal of the American College of Surgeons	85	Dieulafoy's Disease
Matuchansky C	1978	Gastroenterology	76	Jejunal Bleeding from A Solitary Large Sub-Mucosal Artery - Report Of 2 Cases
Nojkov B	2015	World Journal of Gastrointestinal Endoscopy	70	Gastrointestinal Bleeding from Dieulafoy's Lesion: Clinical Presentation, Endoscopic Findings, And Endoscopic Therapy
Park Ch	2004	Endoscopy	63	A Prospective, Randomized Trial of Endoscopic Band, Ligation Versus Endoscopic Hemoclip Placement for Bleeding Gastric Dieulafoy's Lesions
Savides TJ	2000	Gastroenterology Clinics of North America	60	Therapeutic Endoscopy for Nonvariceal Gastrointestinal Bleeding
Matsui S	2002	Gastrointestinal Endoscopy	58	Endoscopic Band Ligation for Control of Nonvariceal Upper Gi Hemorrhage: Comparison with Bipolar Electrocoagulation
Yuan Y	2008	Gastrointestinal Endoscopy	56	Endoscopic Clipping for Acute Nonvariceal Upper-Gi Bleeding: A Meta-Analysis and Critical Appraisal of Randomized Controlled Trials
Yamaguchi Y	2003	Gastrointestinal Endoscopy	54	Short-Term And Long-Term Benefits of Endoscopic Hemoclip Application for Dieulafoy's Lesion in The Upper Gi Tract
Franko E	1991	American Journal of Gastroenterology	54	Massive Rectal Bleeding from A Dieulafoy Type Ulcer of The Rectum - A Review of This Unusual Disease
Jensen DM	2017	Gastroenterology	53	Doppler Endoscopic Probe Monitoring of Blood Flow Improves Risk Stratification and Outcomes of Patients with Severe Nonvariceal Upper Gastrointestinal Hemorrhage
Khamaysi I	2013	Best Practice & Research Clinical Gastroenterology	53	Acute Upper Gastrointestinal Bleeding (Ugib) - Initial Evaluation and Management
Abi-Hanna D	1998	Gastrointestinal Endoscopy	53	Endoscopic Band Ligation for Non-Variceal Non-Ulcer Gastrointestinal Hemorrhage
Jeon HK	2015	Clinical Endoscopy	51	Endoscopic Management of Dieulafoy's Lesion
Kasapidis, P	2002	Gastrointestinal Endoscopy	51	Endoscopic Management and Long-Term Follow-Up of Dieulafoy's Lesions in The Upper Gi Tract
Romaozinho JM	2004	Endoscopy	49	Dieulafoy's Lesion: Management and Long-Term Outcome
Mumtaz R	2003	Journal Of Clinical Gastroenterology	49	Outcomes Of Endoscopic Treatment of Gastroduodenal Dieulafoy's Lesion with Rubber Band Ligation and Thermal/Injection Therapy
Manno M	2016	Surgical Endoscopy and Other Interventional Techniques	48	First-Line Endoscopic Treatment with Otsc in Patients With High-Risk Non-Variceal Upper Gastrointestinal Bleeding: Preliminary Experience In 40 Cases
Atallah S	2013	Techniques In Coloproctology	47	Transanal Minimally Invasive Surgery (Tamis): Applications Beyond Local Excision
McClave SA	1988	Digestive Diseases and Sciences	46	Dieulafoys Cirroid Aneurysm of The Duodenum
Van Der Werf TS	1999	Thorax	45	Fatal Haemorrhage from Dieulafoy's Disease of The Bronchus

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Wong RH	1998	Endoscopy	45	Endoscopic Ligation for Non-Esophageal Variceal Upper Gastrointestinal Hemorrhage
Bedford RA	1992	American Journal of Gastroenterology	45	Gastric Perforation After Endoscopic Treatment of a Dieulafoys Lesion
Sakai E	2019	World Journal of Gastroenterology	44	Diagnosis And Therapeutic Strategies for Small Bowel Vascular Lesions
Kurt M	2010	Canadian Journal of Gastroenterology And Hepatology	43	Ankaferd Blood Stopper for Controlling Gastrointestinal Bleeding Due to Distinct Benign Lesions Refractory to Conventional Antihemorrhagic Measures
Jensen DM	2021	Clinical Gastroenterology and Hepatology	41	Randomized Controlled Trial of Over-The-Scope Clip as Initial Treatment of Severe Nonvariceal Upper Gastrointestinal Bleeding
Sone Y	2005	Endoscopy	41	Endoscopic Management and Follow Up of Dieulafoy Lesion in The Upper Gastrointestinal Tract
Blecker D	2001	American Journal of Gastroenterology	41	Dieulafoy's Lesion of The Small Bowel Causing Massive Gastrointestinal Bleeding: Two Case Reports and Literature Review
Kalafateli M	2012	Digestive Diseases and Sciences	40	Non-Variceal Gastrointestinal Bleeding in Patients with Liver Cirrhosis: A Review
Iacopini F	2007	Gastrointestinal Endoscopy	39	Hemostasis Of Dieulafoy's Lesions by Argon Plasma Coagulation (With Video)
Ang D	2012	European Journal of Gastroenterology & Hepatology	38	A Comparison of Surgery Versus Transcatheter Angiographic Embolization in The Treatment of Nonvariceal Upper Gastrointestinal Bleeding Uncontrolled by Endoscopy
Stollman NH	1997	Gastrointestinal Endoscopy	37	The Uncleared Fundal Pool in Acute Upper Gastrointestinal Bleeding: Implications and Outcomes
Asaki S	1988	Tohoku Journal of Experimental Medicine	37	Endoscopic Diagnosis and Treatment of Dieulafoys Ulcer
Barker KB	2005	Gastrointestinal Endoscopy	35	Safety Of Band Ligator Use in The Small Bowel and The Colon
Pinho R	2016	European Journal of Gastroenterology & Hepatology	33	Long-Term Rebleeding Risk Following Endoscopic Therapy of Small-Bowel Vascular Lesions with Device-Assisted Enteroscopy
Armellini E	2015	World Journal of Gastroenterology	33	Novel Endoscopic Over-The-Scope Clip System
Stoopen E	2001	Chest	32	Dieulafoy's Disease of The Bronchus in Association with A Paravertebral Neurilemoma
Mcgrath K	1999	American Journal of Gastroenterology	32	Endoscopic Band Ligation of Dieulafoy's Lesion: Report of Two Cases and Review of The Literature
Samuel R	2018	Dm Disease-A-Month	31	Evaluation And Management of Non-Variceal Upper Gastrointestinal Bleeding
Löschhorn C	2006	Respiration	30	Dieulafoy's Disease of The Lung: A Potential Disaster for The Bronchoscopist
Al-Mishlab T	1999	Journal of the Royal College Of Surgeons Of Edinburgh	30	Dieulafoy's Lesion: An Obscure Cause of Gi Bleeding
Ahn DW	2012	Gastrointestinal Endoscopy	29	Hemostatic Efficacy and Clinical Outcome of Endoscopic Treatment of Dieulafoy's Lesions: Comparison of Endoscopic Hemoclip Placement and Endoscopic Band Ligation
Gadenstätter M	1998	Journal Of Clinical Gastroenterology	29	Dieulafoy's Disease of The Large and Small Bowel

Twenty publications (40%) originated from the United States, 6 (12%) from Japan, 4 (8%) from United Kingdom and South Korea, and 2 (4%) each from Portugal, Italy, and Switzerland.

Table 2: Countries of origin.

Country of origin	No. of articles
United States	20
Japan	6
United Kingdom	4
South Korea	4
Portugal, Italy, Switzerland	2

Table 3: Top journals of publication.

Most articles published on Dieulafoy’s Lesions were in Gastrointestinal Endoscopy (13). The second most common journal destination was the American Journal of Gastroenterology (5), followed by Endoscopy (4) and Digestive Diseases and Science with three (3) articles.

Journal	No. of articles
Gastrointestinal Endoscopy	13
American Journal of Gastroenterology	5
Endoscopy	4
Digestive Diseases and Science	3

The 2000s was the most active decade of publication (18 papers) followed by 2010s with fifteen (15) articles published in that decade. This was followed by the 1990s with thirteen (13) articles and the 1980s with two (2) articles. The 1970s and 2020s were the least active with 1 published article per decade.

Table 4: Decades of publication.

Decade	No. of articles
1970s	1
1980s	2
1990s	13
2000s	18
2010s	15
2020s	1

A total of 48 institutions contributed to the top 50 articles. Mayo clinic and University of California (Los Angeles) contributed the most with two articles each (Table 6).

Table 5: Top institutions of publication.

Institution	Location	No. of articles
Mayo Clinic	Rochester, MN	2
University of California (LA)	Los Angeles, CA	2

There were two top published authors: Franko E with two articles and Jensen DM with two articles as well. The remaining authors published an article each.

Table 6: Top cited authors.

Author(s)	No. of articles
Franko E	2
Jensen DM	2

Discussion

Dieulafoy’s lesions are rare, upper gastrointestinal anomalies that are primarily managed by a multi-disciplinary team primarily composed of gastroenterologists, intervention radiologists, and vascular surgeons [4]. Historically, Dieulafoy’s lesions was treated with either gastrectomy or gastronomy [1,4]. However, endoscopic modalities have replaced the surgical approaches, which include mechanical banding with hemoclips, sclerotherapy with regional epinephrine or norepinephrine regional injection, and use of heat, thermal or plasma coagulation [1,4,5]. Understanding the top cited articles may serve as a vehicle to drive advances in Dieulafoy’s research.

The most cited article was the 2010 work by Baxter M, which discusses current trends in the Diagnosis and Management of Dieulafoy’s lesion [6]. The article was published in the Annals of the Royal College of Surgeons of England and cited 170 times. Using the Medline database, the authors identified 45 relevant articles, which were analyzed for the review. They found that 80% of all Dieulafoy’s lesions were caused by peptic ulcers, esophageal and duodenal erosions [6]. Moreover, if left undiagnosed or untreated, may cause a mortality rate of up to 80% as well. While he reported no consensus on the treatment of Dieulafoy’s at the time, therapeutic endoscopy was utilized up to 90% of the time, with angiography proposed as a viable alternative in the event of treatment failure. Lastly, the authors credited the reduction of mortality from 80% to roughly 9% to the advancements in endoscopy [6].

The second most cited article was published in 2000 by Chung et al. in the journal Gastrointestinal Endoscopy and discussed the choice of endoscopic methods on treating Dieulafoys lesions [7]. A total of 24 patients were randomized into either the mechanical endoscopic method using hemoclips and banding, or the endoscopic injection therapy. The authors found that less therapeutic endoscopic sessions were needed to achieve permanent hemostasis for the mechanical therapy group compared to the injection therapy group (1.17 vs 1.67) [7]. Moreover, a higher percentage of initial hemostasis was achieved in the mechanical therapy group compared to the injection therapy cohort. (91% vs 75%). Based on their results, the authors recommended endoscopic mechanical therapy for the treatment of Dieulafoy’s lesions when compared to other endoscopic approaches as it improves initial hemostasis, requires less endoscopic sessions, and has a lower rate of recurrent bleeding [7].

The third most cited article was the 2003 review article by Lee TY et al titled Dieulafoy’s Lesion, which was also published in the journal Gastrointestinal Endoscopy.8 In this article, the authors detail important characteristics of Dieulafoy’s lesion found on histologic examination. In the slides shown, they point out persistent artery tracking through the gastric submucosa, which ultimately becomes exposed, erodes, and causes bleeding [8]. They also call to attention different findings reported by other pathologists to help explain the lesion, which include pressure erosion of the ectatic vessel through the overlying epithelium, and abnormally fixed vessel in the muscularis mucosa. Ultimately, the authors subscribed to the findings that dysplastic changes leading to subintimal fibrosis, loss of elastic fibers near the necrotic arterial wall, and thinning of arterial fibers were terminal histologic finds that led to the Dieulafoy’s pathology [8].

The most recent highly cited paper on the list is by Jensen DM et al. published in 2021. This was a randomized controlled trial where 53 patients were placed into either standard endoscopic hemostasis using hemoclips [28] or large over-the-scope clips (OTSC) [25] for treatment of severe Dieulafoy’s bleeding [9]. Both treatment groups had similar baseline risk factors [9]. The authors found that the OTSC group had significantly less re-bleeding (4% vs 28.6%), complications (0% vs 14.3%), and transfusions when compared to the standard endoscopic treatment group [9].

The oldest highly cited paper was the 1978 article by Matuchansky et al. and details the report of two isolated cases of massive intestinal bleeding from solitary submucosal arterial

abnormality [10]. Both bleeding arteries were discovered in the jejunal submucosa with the aid of abdominal angiography. Histopathological examinations revealed characteristics like that of previously reported Dieulafoy's lesions [10]. The authors' proposed to call their findings "Dieulafoy-like erosion". Treatments were not discussed in this article.

Most centers where the top cited articles originated from were in the United States. Several other countries such as Japan, South Korea, United Kingdom, and Italy were also represented in the top 50 cited list as well. The Gastrointestinal Endoscopy journal accounted for 26% of all publications on the list. The most active decade of publication was the 2000s. Two authors: Jensen DM and Franko E were the top cited authors.

We acknowledged some limitations to our study. First, given the dynamic nature of citations, the results from an earlier search (June 2024) may have changed if conducted at present. Nevertheless, a drastic or dramatic change would be unlikely. Another notable limitation is the publication frequency of a journal. For example, some journals may be published quarterly, while others are monthly or biweekly. Consequently, they may appear more often in the top cited list. Lastly, excluding non-English publications may have limited or altered the search results.

To our knowledge, this is the first study that evaluates the most clinically impactful, top cited research articles about Dieulafoy lesions. Most articles originated in the top-cited list originated from the United States and published in the 2000s. The most frequently cited journals were Gastrointestinal Endoscopy and American Journal of Gastroenterology. Understanding the rarity of these vascular abnormalities, historical findings, and current trends will help advance research in Dieulafoy's lesions. Moreover, rapid advancements in endoscopic treatment will undoubtedly impact the incidence, prevalence, complications, and mortality of Dieulafoy's lesions. As a result, it would be

worthwhile to revisit the inquiry regarding the top cited Dieulafoy lesion articles in the future as this article describes the current state of the most impactful articles.

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