Epilepsy Surgery for Drug-Resistant Epilepsy in Africa: A Systematic Review

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BACKGROUND AND OBJECTIVES: Nearly one-third of individuals with epilepsy have drug-resistant epilepsy, treated most effectively with surgery. This study aims to discuss the demographic profile, surgical access, and strategies used in drug-resistant epilepsy in Africa.

METHODS: A systematic review was performed using PubMed, Google Scholar, Embase, and Web of Science in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-analyses guidelines.

RESULTS: Nine studies encompassing 498 patients from 6 African countries (Egypt, Kenya, Morocco, South Africa, Tunisia, and Uganda) were included. The mean Methodological Index for Non-Randomized Studies score for these articles was 9.6 ± 1.6. The average patient age was 24.9 years (95% CI: 18.9-30.8 years), with a male predominance of 53.4%. The average age of seizure onset was 10.4 years (95% CI: 6.1-14.7 years). Most patients experienced focal onset seizures (73.1%), with head trauma (33.1%) being the most reported risk factor. The predominant etiologies were hippocampal sclerosis (66.8%, 95% CI: 42.7-91), microdysgenesis (26.7%, 95% CI: 20.7-32.7), and brain tumors (22.3%, 95% CI: 6.4-38.2). Lesions were primarily located in the left hemisphere (61.9%, 95% CI: 26.7-97.1), with temporal lobe involvement in 54.8% of cases (95% CI: 28.7-80.8). Temporal lobectomy was the most frequently performed surgery (59.6%), followed by lesionectomy (9.6%). Postoperatively, 80.6% of patients achieved Engel class I outcomes, indicating seizure freedom, and long-term follow-up (1 to 5 years) showed that 70.3% maintained Engel class I outcomes. Surgical complications were reported in 8.8% of cases.

CONCLUSION: These findings demonstrate the efficacy and long-term benefits of epilepsy surgery in Africa, where epilepsy is a significant public health challenge. The high rates of seizure freedom and reduced seizure frequency from surgery highlight its potential to improve the quality of life for individuals with drug-resistant epilepsy in Africa.

KEY WORDS: Drug-resistant epilepsy, Epilepsy, Epilepsy surgery, Engel outcome, Africa

Epilepsy is a significant global health issue, affecting approximately 50 million people worldwide.[1] While epilepsy affects individuals across all regions, the burden is markedly higher in low- and middle-income countries (LMICs) due to factors such as head trauma, infectious diseases, congenital abnormalities, and inadequate healthcare during the neonatal period.[2] Approximately 30% of patients with epilepsy are medically refractory.[3] Drug-resistant epilepsy (DRE) represents a major problem in epileptology because of associated increased morbidity and mortality.[3] In LMICs, particularly in Africa, the situation is further complicated by sociocultural barriers, such as lack of awareness, widespread stigma, and limited access to specialized care.[4-6] In addition, economic constraints, such as prohibitive surgical costs, further aggravated by productivity losses during the

ABBREVIATIONS: DRE, drug-resistant epilepsy; **HS,** hippocampal sclerosis; **LMICs,** low- and middle-income countries.

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perioperative period likely play a significant role.[7] These often delay diagnosis and treatment, resulting in a higher prevalence of DRE.[2] While the challenges in LMICs exacerbate the prevalence of refractory epilepsy, advancements in surgical treatments offer a promising solution to address these issues.

Temporal lobe epilepsy, the most common type of drug-resistant epilepsy, is often treated with temporal lobe resections as the primary surgical intervention. Studies have shown that up to 80% of patients who undergo this procedure become seizure-free[8,9] In addition to temporal lobe resections, a range of resection and disconnection procedures have been described globally. In high-income countries, advanced techniques such as neuromodulation have also shown promise in improving outcomes for patients with refractory seizures.[10]

The first dedicated epilepsy surgery program in Africa was established in Morocco in 2005.[2] Despite this promising development nearly 2 decades ago, there remains a significant treatment gap because of the limited number of centers offering such surgical interventions across the continent and subsequently a relative lack of comprehensive long-term data on surgical outcomes.[6] This study aims to summarize articles on epilepsy surgery for DRE in Africa, focusing on patient demographics, etiologies, surgical options, and outcomes. By analyzing these aspects, the research seeks to inform future interventions and improve patient care.

METHODS

Search Strategy

A literature search was conducted according to the Preferred Reporting Items for Systematic Reviews and Meta-analyses guidelines using electronic databases PubMed, Google Scholar, Embase, and Web of Science (Figure 1). This study was not registered in the International Prospective Register of Systematic Reviews registry. The key search terms included "Epilepsy surgery" OR "drug resistant epilepsy" AND "Africa" and "Epilepsy surgery" OR "drug resistant epilepsy" AND [each African country], combined with "presentation," "management," and "outcome" using Boolean operators AND/OR, with no timeframe limit. We included original articles reporting on the epidemiology, risk factors, clinical presentation, management, or outcomes of DRE in Africa, defining DRE as the failure of adequate trials of 2 tolerated, appropriately chosen, and used antiepileptic drug schedules to achieve sustained seizure freedom.[11] Articles had to focus on patients with DRE, who had resective procedures. Articles were excluded if they were literature reviews, correspondences, commentaries, case reports/series, letters to editors, book chapters, animal studies, opinion pieces, systematic reviews, and meta-analyses. The Methodological Index for Non-Randomized Studies was used to evaluate the methodological quality of the included studies. This tool assesses studies on a scale from 1 (poor quality) to 16 (high quality), focusing on different elements of study design.

Data Extraction

The screening process was conducted independently by 5 authors (K.D., P.T., O.A., M.A., and W.E.Y.) following the search strategy and using a data extraction form designed by the team. Initially, articles were screened based on titles, followed by abstracts and full texts to determine eligibility. Subsequently, 3 authors (K.D., W.E.Y., P.T.) reviewed the full texts to finalize the inclusion of articles and extract relevant data. The bibliographies of included articles were also examined for additional relevant studies. Disagreements were resolved through consensus meetings.

The selected articles were then assessed using our data extraction methodology. The extracted variables included: (1) demographic information (age and sex), (2) seizure classification, (3) risk factors and etiology, (4) diagnostic modalities, (5) management options, and (6) Engel epilepsy surgery outcome scores. To provide a comprehensive overview and critically evaluate the articles, we also documented the limitations and conclusions of each study, along with bibliometric details such as study design, year of publication, and country of origin.

Statistical Analysis and Summary of Literature

Descriptive statistics were used to categorize demographics, risk factors, surgical modalities, and surgical outcome measures. We conducted a random effects model, inverse variance-weighted meta-analysis using the *metafor*, *meta*, and *metadat* packages in R Studio (Version 4.3). This analysis pooled data to estimate the prevalence of etiology and lesion location in epilepsy surgery patients. The precision of the meta-analysis was evaluated by 95% CI. Heterogeneity was assessed using the Cochran Q and I^2 statistics.

RESULTS

Electronic Search Yield

Of 127 identified sources, 59 duplicates were removed, and 68 were assessed for inclusion criteria, resulting in 9 retrospective/prospective articles (Figure 1)[2-4,12-17] with 498 patients (**Supplemental Digital Content 1**, http://links.lww.com/NEU/E614). The 9 articles came from 6 African countries—Egypt, Kenya, Morocco, South Africa, Tunisia, and Uganda. Egypt had the largest patient cohort, comprising 184 of 498 patients (36.9%), followed by Morocco with 157 (31.5%) (Figure 2). The mean Methodological Index for Non-Randomized Studies score for these articles was 9.6 ± 1.6.

Demographics, Presurgical Clinical Manifestations, and Diagnostics

Table 1 details the demographics, seizure classification, and risk factors of patients included in the review. Among the studies providing demographic data (n = 8), 53.4% of patients were male (214/401) with a mean age of 24.9 years (95% CI: 18.9-30.8). The average age at seizure onset, documented in 5 studies, was 10.39 years (95% CI: 6.1-14.7 years). Among 208 patients across 4 studies, 73.1% had focal onset seizures (152/208), and 26.9% had generalized seizures (56/208). Of those with focal onset seizures, 9.2% had focal aware seizures (14/152), and 67.1% had focal impaired awareness seizures (102/152). Head trauma was the most common risk factor for DRE at 33.1% (86/260), followed by febrile seizures at 19.6% (51/260). Other risk factors

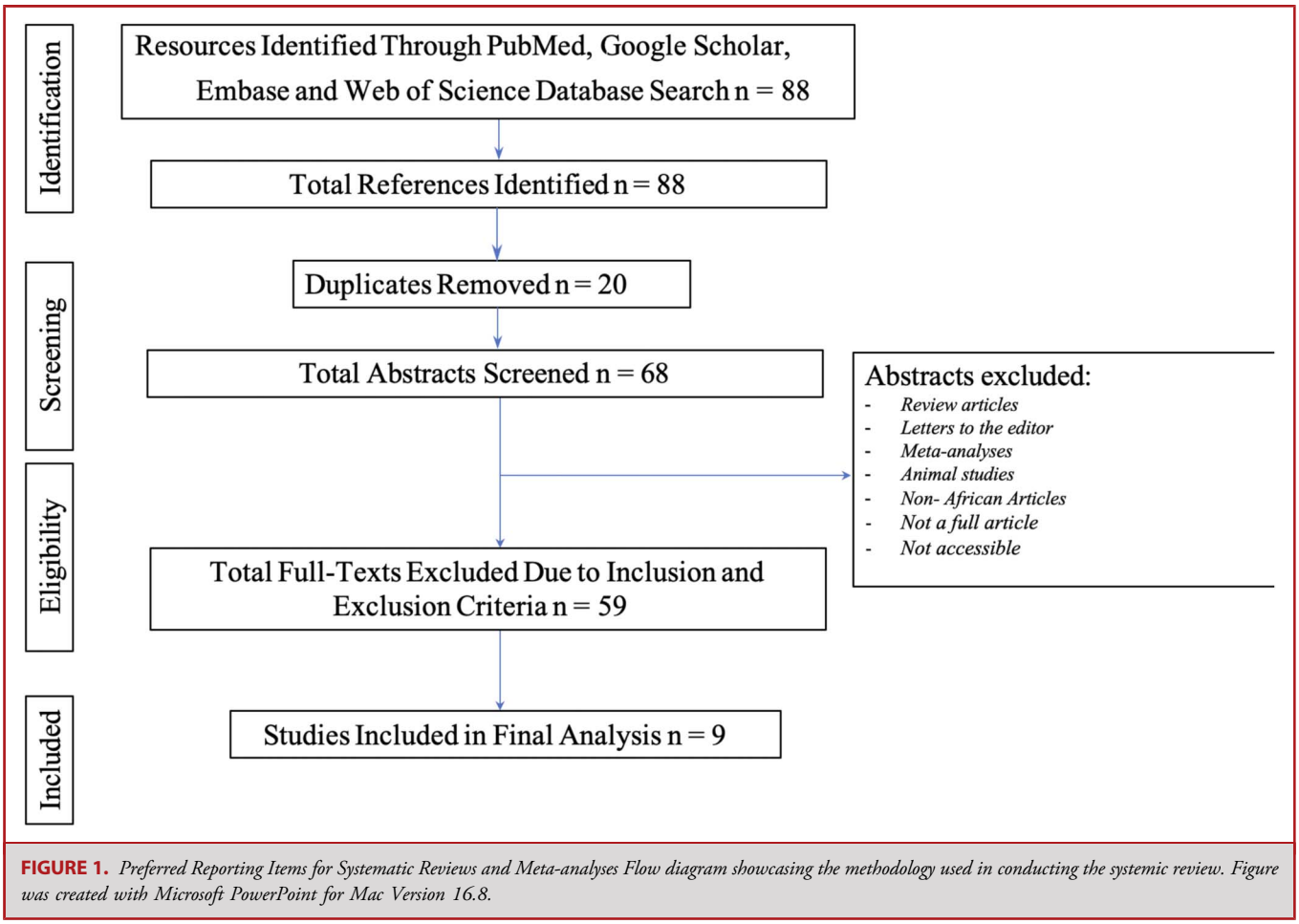

FIGURE 1. *Preferred Reporting Items for Systematic Reviews and Meta-analyses Flow diagram showcasing the methodology used in conducting the systemic review. Figure was created with Microsoft PowerPoint for Mac Version 16.8.*

included perinatal hypoxia (5.4%, 14/260) and family history of seizures (2.3%, 6/260). Preoperative imaging and investigations showed that CT was used in 54.3% (204/376), MRI in 85.9% (323/376), and scalp electroencephalogram in 97.3% (366/376) of patients, while neuropsychologic evaluations were reported in 31.1% (117/376).

Meta-Analysis of Etiology and Hemispheric Involvement

The meta-analysis included all 9 nonrandomized studies[2–4,12–17] reporting on the etiology and hemispheric involvement of patients undergoing epilepsy surgery (Table 2). The most common etiology was hippocampal sclerosis (HS), found in 66.8% (95% CI: 42.7%-91.0%) of cases, followed by microdysgenesis at 26.7% (95% CI: 20.7%-32.7%). Brain tumors were present in 22.3% (95% CI: 6.4%-38.2%) of cases and vascular malformations in 2.8% (11/394) with a prevalence of 3.7% (95% CI: 1.2%-6.3%). Other etiologies, including gliosis, cortical dysplasia, and brain atrophy, constituted 16.4% (95% CI: 9.2%-23.5%) of cases. Lesions were predominantly in the left hemisphere (61.9%, 95% CI: 26.7%-97.1%), with temporal lobe involvement in 54.8% (95% CI: 28.7%-80.8%) and extratemporal lesions in 38.4% (95% CI: 20.0%-56.7%).

Surgical Modalities and Epilepsy Surgery Outcome Measures

Among patients, 95.4% (475/498) underwent surgery for DRE and were included in the meta-analysis (Table 3). Detailed information on the types of surgical procedures for removing the epileptogenic zone was provided only for 45.9% (218/475) of patients across 6 articles.[2,4,13,15-17] Temporal lobectomy was the most common reported resective procedure, performed in 59.6% (130/218) of cases, followed by cortical amygdalohippocampectomy (9.2%, 20/218) and lesionectomy (9.6%, 21/218).

Postoperative outcomes, reported in 6 studies,[2-4,12,15,16] showed that 80.6% (174/216) of patients achieved Engel I outcomes. Engel II outcomes were observed in 13.9% (30/216) of patients. Less favorable outcomes included Engel III in 3.7% (8/216) and Engel IV in 1.9% (4/216). Follow-up data (1 to 5 years) indicated that 70.3% (78/111) of patients had Engel I outcomes,

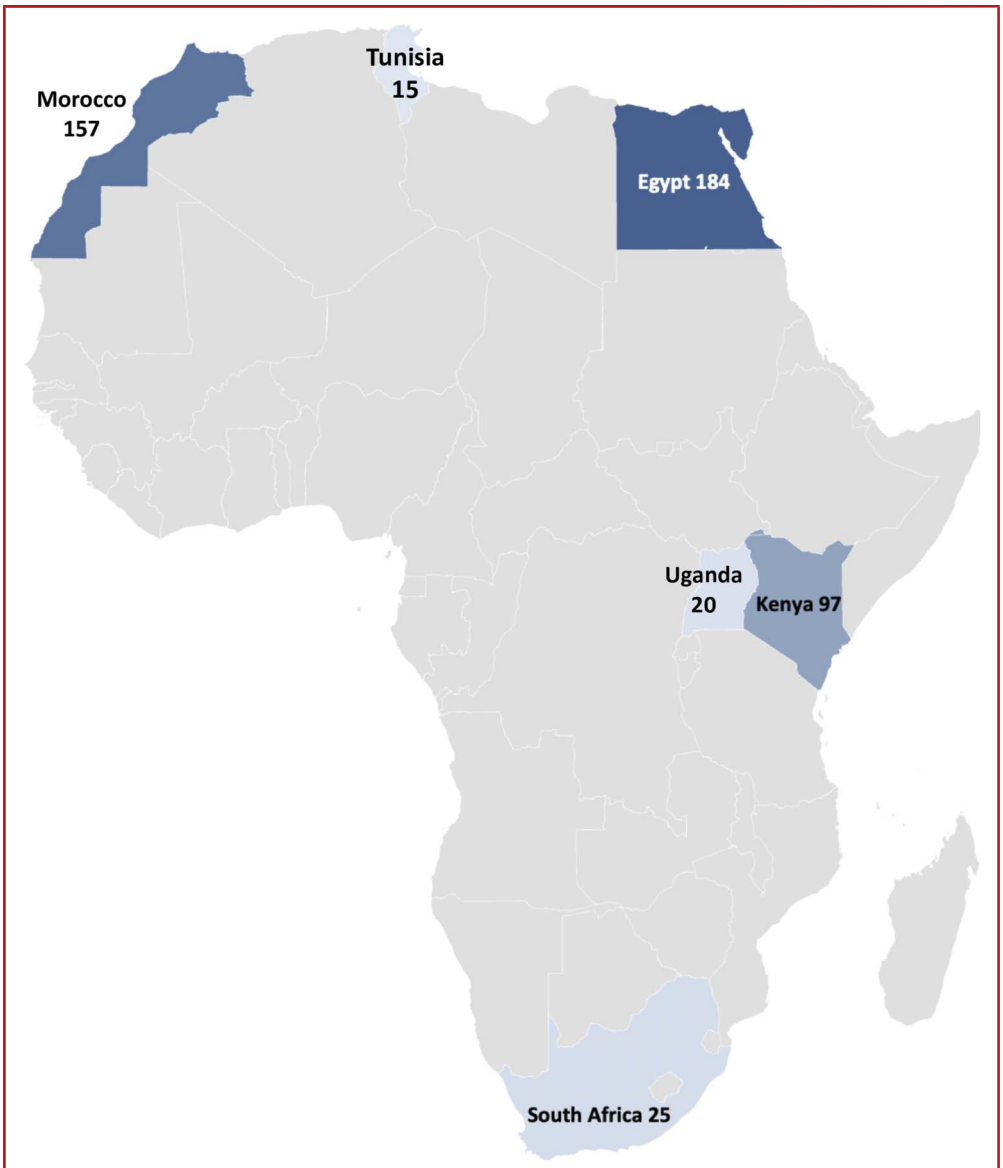

FIGURE 2. *African map showing the cumulative frequency of patients in the included articles. Figure was created with Microsoft Excel for Mac Version 16.8.*

17.1% (19/111) were Engel II, 11.7% (13/111) were Engel III, and 0.9% (1/111) were Engel IV. Surgical complications were reported in 8.8% (18/204) of cases across 5 studies.[2,4,12,13,16]

DISCUSSION

The management of DRE in Africa presents unique challenges owing to sociocultural barriers, limited healthcare resources, and a lack of specialized medical care. Our systematic review, covering 6 African countries, highlights a predominance of male patients, with an average seizure onset at 10.4 years. Common risk factors included head trauma and febrile seizures. Temporal lobe epilepsy was the most frequent form of DRE. Resective epilepsy surgery, particularly temporal lobectomy, yielded favorable outcomes, with most patients achieving seizure freedom both postoperatively and in the long term. These findings highlight the potential for surgical interventions to significantly improve outcomes for individuals with DRE, even in resource-limited settings, demonstrating that with proper training, resources, and infrastructure, similar results could be achieved globally. By addressing the successes and challenges identified in Africa, the global epilepsy community can work

TABLE 1. Demographics, Seizure Classification, and Risk Factors of Patients

Variable	Percentage (sum/total)
Demographics	
Male	53.4 (214/401)
Female	46.6 (187/401)
Mean age (y)	24.88 (95% CI: 18.96-30.80)
Age at onset of seizures (y)	10.39 (95% CI: 6.05-14.72)
Seizure classification	
Generalized seizures	26.9 (56/208)
Focal onset	73.1 (152/208)
Focal aware seizures	9.2 (14/152)
Focal onset impaired awareness seizures	67.11 (102/152)
Risk factors	
Febrile seizures	19.6 (51/260)
Head trauma	33.1 (86/260)
Perinatal hypoxia	5.4 (14/260)
Family history of seizures	2.3 (6/260)
Other*	39.6 (103/260)
Preoperative imaging/investigations	
CT	54.3 (204/376)
MRI	85.9 (323/376)
EEG	97.3 (366/376)
Neuropsychologic evaluation	31.1 (117/376)

CT, computed tomography; EEG, electroencephalogram.
Other*: No medical history (61), history of infection (16), consanguinity (6), diabetes (5), history of belching (5), previous surgery (5), delayed milestones (1), hypertension (2), asthma/COPD (1), ischemic heart disease (1).

toward more equitable access to life-changing surgical treatments for DRE.

Patient Demographics, Risk Factors, and Etiology

Our study revealed a gender disparity, with DRE being slightly more common in men and identified head trauma and a history of febrile seizures as key risk factors. While most studies do not explicitly address gender differences in DRE, previous research has suggested that genetic and neurobiological factors may contribute to the higher prevalence of DRE in men.[18-20] Small clinical studies indicate that medication compliance, lifestyle factors, psychiatric comorbidities, and specific seizure types—more commonly observed in men—could contribute to this disparity.[21,22] Research by Semah et al[23] found that over 5% of DRE patients undergoing surgical treatment had seizures linked to previous trauma. This suggests that individuals with post-traumatic epilepsy are at a higher risk of developing DRE.[24] The prominence of head trauma as a significant risk factor likely exacerbates the observed gender disparity as traumatic brain injuries are prevalent and more common among men, especially in younger age groups.[25] It is important to note that the observed gender disparity pertains specifically to patients who underwent resective procedures and does not accurately reflect the overall gender prevalence of DRE in Africa. Characterizing the true gender distribution of DRE requires a different approach and inclusion criteria, which fall beyond the scope of this review.

Febrile seizures are the most prevalent type of convulsions experienced by children.[26] In a multisite study conducted in Argentina, Lagger et al[27] identified febrile seizures as a significant risk factor for the development of DRE. However, population-level studies on febrile seizures are limited, particularly in LMICs and sub-Saharan Africa, despite reports of higher incidence in these regions.[28] The association between head trauma, febrile seizures, and DRE in the literature suggests the need for targeted preventive public health interventions. It also highlights the need for African healthcare systems to address both acute and long-term complications of neurotrauma, including secondary conditions like epilepsy. In addition, the prevalence of head injuries may reflect broader socioeconomic issues, such as inadequate infrastructure, insufficient safety regulations, and limited healthcare access.[29] Addressing these underlying factors could help reduce the incidence of head injuries and DRE among African patients.

Our review identified HS as the most frequently reported epileptogenic substrate, with other lesional etiologies also contributing to a significant number of cases. HS is known to be the most common cause of drug-resistant focal epilepsies, particularly mesial temporal lobe epilepsy, and is observed in up to 70% of DRE cases.[30,31] The high prevalence of HS in African patients is significant, as those with lesional etiologies typically experience better outcomes,[32] suggesting that resective surgery could be beneficial even in resource-limited settings. However, this prevalence may be influenced by patient selection criteria in the studies reviewed, highlighting the need for further research to validate these findings.

Epilepsy Surgery Procedures and Engel Outcome Score

Temporal lobectomy was the most reported resective surgery for DRE in African literature, consistent with previous studies. This procedure is frequently used for mesial temporal lobe epilepsy, often associated with HS.[33] The predominance of temporal lesions and HS in our study explains the reported high prevalence of temporal lobectomies. This surgery is known for its significant efficacy, with up to 70% of patients achieving seizure freedom postoperatively.[33] By contrast, extratemporal resections are more complex and generally have lower success rates.[34] Our findings, showing 80.6% seizure freedom postsurgery and 70.3% sustained

TABLE 2. Meta-Analysis of Etiology and Lesion Location in Epilepsy Surgery Patients

Variable	Percentage (sum/total)	Prevalence (CI.LB-CI.UB)	I^2
Etiology			
Hippocampal sclerosis	51.8 (204/394)	66.8 (42.7-91.0)	97.8
Microdysgenesis	14.2 (56/394)	26.7 (20.7-32.7)	0.0
Brain tumors	17.8 (70/394)	22.3 (6.4-38.2)	93.9
Vascular malformations	2.8 (11/394)	3.7 (1.2-6.3)	54.4
Other	13.5 (53/394)	16.4 (9.2-23.5)	53.2
Location of lesion			
Left hemisphere	81.8 (45/55)	61.9 (26.7-97.1)	85.2
Right hemisphere	18.2 (10/55)	46.4 (7.6-85.2)	96.7
Temporal	71.7 (223/311)	54.8 (28.7-80.8)	99.0
Extratemporal	28.3 (88/311)	38.4 (20-56.7)	91.1

CI.LB, CI lower bound; CI.UB, CI upper bound; I^2, Heterogeneity Index.
Other: gliosis (19); cortical dysplasia (14); dual pathology (8); Rasmussen syndrome (6); focal neuronal loss (3); brain atrophy (1); epidermoid cyst (1); hemimegalencephaly (1).

freedom at 1-year follow-up, align with existing literature. For instance, Wiebe et al[35] reported a 58% seizure freedom rate in temporal lobe epilepsy patients, whereas Engel et al[36] noted an 85% rate, along with improvements in quality of life and social functioning.

The current existing literature reports again on the well-established efficacy of resective surgery in managing DRE. However, interpretation of these improvement rates must be done with caution because of potential biases in patient selection, as indicated by the predominance of lesional patients and the high frequency of temporal lobectomies, which were reported in approximately 60% of cases. In addition, the small sample sizes of most studies included in the review may affect the generalizability of these outcomes. Of the 498 patients discussed, 475 underwent resective surgery, while the remaining patients did not have surgery because of factors such as patient deferral, prolonged waiting times, being surgically unfit, and limited finances for surgery.[3,16] These factors are prevalent in resource-limited settings and significantly affect the availability and execution of resective surgeries. Patient refusal may occur owing to a lack of awareness, fear of the procedure, or cultural factors.[2] Prolonged waiting times often result from inadequate healthcare infrastructure and staffing shortages, which can delay or prevent timely surgical interventions. Patients deemed surgically unfit may face such determinations owing to comorbid conditions or the lack of necessary preoperative evaluations.[3] Financial constraints can be a major barrier, as the cost of surgery and related care might be prohibitive for many patients, particularly in low-income settings.[12] The cumulative effect of these issues contributes to the limited number of surgeries performed and, consequently, to the sparse literature on epilepsy surgery in such contexts. As many surgeries are not conducted owing to these barriers, the existing body of research does not fully represent the true prevalence and outcomes of resective procedures in these regions, highlighting a significant gap in the understanding and documentation of epilepsy surgery in resource-limited settings. It is crucial for local programs to assess the prevalence of DRE and explore the feasibility of establishing functional neurosurgery programs. Collaborative efforts, both international and intranational, should prioritize scaling up these surgical interventions to enhance access and improve outcomes for more patients across Africa. Despite the observed barriers in surgical care, the reported figures in this review suggest a high surgical intervention rate. It is important to note that these figures presented in this review may not necessarily reflect the actual proportion of African patients with DRE who are offered resective procedures. The focus of this review and the selection criteria for the included studies may have influenced these numbers, and the true rate may be lower because of factors previously discussed.

Future Directions

Developing sustainable local surgeon training programs is essential for advancing epilepsy surgery in Africa, equipping professionals with the skills needed to perform surgeries and reducing reliance on foreign specialists, thereby fostering greater autonomy and self-sufficiency. Expanding the use of telemedicine for preoperative assessments is also crucial, as it can bridge the gap between remote areas and urban healthcare centers by reducing the need for in-person consultations. This is particularly important in regions where transportation infrastructure is limited,

TABLE 3. Surgical Approaches and Epilepsy Surgery Outcome Measures

Variable	Percentage (sum/total)
Surgical interventions	95.4 (475/498)
Surgical epilepsy procedures	
Temporal lobectomy	59.6 (130/218)
Selective amygdalohippocampectomy	5.1 (11/218)
Hippocampectomy	4.6 (10/218)
Anterior callosotomy	3.2 (7/218)
Cortical amygdalohippocampectomy	9.2 (20/218)
Hemispherectomy	6.4 (14/218)
Lesionectomy	9.6 (21/218)
Gamma knife	2.3 (5/218)
Complications of surgery	8.8 (18/204)
Engel epilepsy surgery outcome scale	
Post-Op Engel I	80.6 (174/216)
Post-Op Engel II	13.9 (30/216)
Post-Op Engel III	3.7 (8/216)
Post-Op Engel IV	1.9 (4/216)
Range of follow-up (y): 1-5 years	
Last FU Engel I	70.3 (78/111)
Last FU Engel II	17.1 (19/111)
Last FU Engel III	11.7 (13/111)
Last FU Engel IV	0.9 (1/111)

FU, follow-up.

allowing patients to receive timely and appropriate evaluations without the burden of long-distance travel. International collaborations with global neurosurgical societies and institutions will further support epilepsy surgery programs by facilitating access to advanced technologies, such as MRI and neuropsychological evaluations, and enabling knowledge-sharing and collaborative problem-solving. These partnerships will help local healthcare systems grow sustainably, making more efficient use of resources.

Existing African institutions with ongoing epilepsy surgery programs can serve as valuable guides for replicating successful models across the continent. Leveraging these experiences will improve the scalability of epilepsy surgery programs and help narrow the identified gaps in surgical care. Strengthening research and capacity-building initiatives, along with the establishment of dedicated databases, will also play a critical role in addressing the region's unique challenges and enhancing the quality of data and understanding of epilepsy surgery outcomes in Africa.

Limitations

In conducting this systematic review on epilepsy surgery for DRE in Africa, we encountered limitations that must be carefully considered. First, the review included only 9 articles from 6 countries, and the geographical distribution of these studies does not adequately cover all regions of Africa, thus limiting the generalizability of our findings across the continent. None of the primary articles originated from West Africa, thereby excluding an entire region from our analysis. In addition, the review was limited to articles published in English owing to the inability of any of the authors to efficiently translate articles in other languages; this possibly introduces a language bias overlooking critical insights from studies published in other languages, particularly relevant in a linguistically diverse continent such as Africa. Finally, detailed information on resective surgeries was available for less than 50% of cases, which limits our ability to comprehensively assess the variety of surgical procedures conducted across the continent. Furthermore, majority studies did not have information regarding patients' previous antiepileptic drugs. The estimated treatment effects are liable to overrepresentation owing to selective reporting and publication biases. These gaps in data emphasize the need for more extensive and inclusive research to accurately delineate the scope and outcomes of epilepsy surgery in Africa. Despite the stated limitations and findings being derived from only 9 original articles, this review provides valuable insights into the surgical management of drug-resistant epilepsy in Africa by detailing the outcomes of these patients and contributing to the limited but growing body of knowledge on epilepsy surgery in Africa.

CONCLUSION

The current literature suggests the effectiveness of epilepsy surgery as a treatment option in Africa, where the DRE imposes a substantial public health burden amidst limited resources. Despite these challenges, surgical intervention resulted in high rates of seizure freedom and significant reductions in seizure frequency. These outcomes highlight the potential of epilepsy surgery to markedly improve quality of life for individuals in the region. Further research is however necessary to enhance the understanding of epilepsy surgery in Africa.

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Supplemental digital content *is available for this article at neurosurgery-online.com.*

Supplemental Digital Content 1. Table. Demographics, clinical characteristics, management strategies, and outcomes of all studies included in the systematic review.

COMMENTS

This systematic review offers a compelling and timely analysis of epilepsy surgery for drug-resistant epilepsy (DRE) in Africa, addressing a critical yet underexplored area of healthcare for this region. By synthesizing studies from 6 African countries, the authors demonstrate that epilepsy surgery can substantially improve seizure control, even in resource-limited settings. Their findings highlight the potential for surgical intervention to alleviate the significant public health burden posed by DRE in Africa, providing a pathway toward improved quality of life for affected individuals.

The authors effectively bring to light several barriers that impede broader access to epilepsy surgery in African settings, including limited healthcare infrastructure, cultural factors, and financial constraints. Their recommendations for local surgeon training programs, telemedicine, and international collaborations are relevant and actionable, offering a strategic framework for expanding epilepsy surgery services across the

continent. By building on the strengths of existing African epilepsy surgery programs and proposing scalable solutions, the authors establish a forward-looking agenda for epilepsy care in Africa. Expanding access to epilepsy surgery not only has the potential to improve individual quality of life but may also alleviate healthcare burdens and enhance overall economic productivity by reducing the long-term impact of untreated epilepsy.

Some limitations should be acknowledged. The review's geographic scope is limited, with no representation from West Africa, which reduces the generalizability of the findings across the continent. The restriction to English-language studies may also introduce a language bias, potentially overlooking valuable research from non-English-speaking countries. Addressing these gaps in future research would allow for a more comprehensive understanding of the potential challenges of epilepsy surgery in Africa. The findings from this review may also hold relevance for other low- and middle-income countries, offering guidance on how resource-limited settings can effectively incorporate epilepsy surgery into public health frameworks.

Overall, this review contributes to the growing body of knowledge on epilepsy surgery in low- and middle-income countries, specifically focusing on Africa. The authors' balanced assessment and practical recommendations provide a solid foundation for future research and programmatic efforts to improve access to and outcomes of epilepsy surgery across the continent. These findings could serve as a basis for health policymakers and stakeholders to develop targeted strategies that address the unique barriers to epilepsy care in Africa. Future research should explore regional collaborations and cost-effective surgical models to create scalable, sustainable approaches to epilepsy care in diverse African healthcare settings.

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