

# Evaluating the Long-term Efficacy of Endovascular Aneurysm Repair: A Ten-Year Follow-Up Study

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## Abstract

Endovascular aneurysm repair (EVAR) has changed the landscape of care for abdominal aortic aneurysms (AAA), which constitute a considerable danger to health. In "Evaluating the Long-term Efficacy of Endovascular Aneurysm Repair: A Ten-Year Follow-Up," the long-term robustness and efficacy of EVAR are examined. The backdrop highlights the transition from open surgical repair to minimally invasive EVAR and provides insight into the historical context of AAA therapy. The prevalence of AAA and related risk factors highlights the significance of developing therapeutic methods. A thorough analysis of the development of EVAR is provided, emphasising how technical developments have improved the process. Although there is ample evidence of short-term effectiveness, issues, including device migration and endoleaks, demand long-term examination. The results of this study have implications for both scientific and therapeutic practice. The study's results should guide treatment choices, improve surveillance procedures, and advance the development of vascular treatments. Additionally, by exploring the natural history of aneurysms treated with EVAR, the study hopes to advance scientific understanding and promote ongoing advancements in vascular treatment approaches. Finally, this work begins a key investigation into the long-term effectiveness of EVAR, which has the potential to influence AAA treatment plans and improve patient outcomes. The research's main ideas and expected contributions to the scientific and medical communities are succinctly summarized in the study.

## Keywords

Long Term Efficacy (LTE), Endovascular Aneurysm Repair (EAR)

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We are already well familiar with the increasing and effective use of science and technology in the medical field of life for the betterment of humanity and mankind. In this study, we are going to overview the efficiency of Endovascular Aneurysm Repair from a long-term perspective. Aneurysm is an emerging term in the medical field, which means any large bulge or ballooning structure in the wall of any blood vessel. This is quite harmful and dangerous because it can also result in bursting called rupture, which can cause internal bleeding and sudden death. There are different types of aneurysms depending upon different bases as there are two types named fusiform aneurysms and saccular aneurysms<sup>1,2</sup>. In a fusiform aneurysm, that bulge can occur along all the sides of the artery. Still, in the saccular type of aneurysm, a bulge occurs only on one side of that particular artery. There is a variety of treatments are recommended depending on the type and intensity of aneurysm. The main problem is that when an aneurysm stays unruptured, it shows no symptoms, thus making diagnosis and treatment difficult.

Medical imaging is recommended to determine the presence and type of aneurysm, which can provide an idea about the aneurysm. Some medications are also recommended in mild conditions of aneurysm, but in critical conditions of aneurysm, repairing the blood vessel is mandatory<sup>3</sup>. Different treatments and procedures used are as follows, clipping by microsurgical procedure. Bypass of the artery, the occlusion, the diversion

of flow by stents, and the other is Endovascular coiling. The most important of all these treatments is Endovascular Aneurysm Repair, which can be used to repair complicated aneurysms. This treatment is better and more reliable because of various aspects. These aspects include the less invasive option of Endovascular Aneurysm Repair. In traditional methods of aortic repair, surgical methods were mostly used, but those are invasive and time taking. In this type of endovascular aneurysm repair, there is a need for less stay at hospitals and less time for recovery<sup>4</sup>.

The procedure of Endovascular Aneurysm Repair consists of a few steps. In this type of repair treatment, a graft is inserted within the aneurysm with the help of a small groin incision. This method also uses X-rays to properly guide the graft to place it in the correct position. The treatment is quite effective because there is no need for any abdominal surgery. The other benefit of Endovascular Aneurysm Repair is that there is less blood loss in this repair method compared to traditional surgery. The other benefit is that there is no requirement for an intensive care unit for this kind of repair treatment. The duration of pain and trauma is also reduced in this repair treatment as compared to traditional means of surgery for aneurysms<sup>5</sup>. The next benefit is that this repair method has a faster recovery rate, making it more beneficial for aneurysm treatment. There are fewer complications and less discomfort related to the Endovascular Aneurysm Repair method. As described earlier, there are many benefits of using Endovascular Aneurysm

Repair for treatment of aneurysm, but there are also some disadvantages related to Endovascular Aneurysm Repair. The first and foremost issue is that the patient must go through different procedures to refine the initial ones. The other problems related to Endovascular Aneurysm Repair are as follows, any deployment of the device, any kind of leakage because of inadequate fixation, the graft may seal in the wall of the vessel, the grafted material can undergo any kind of breakdown, any kind of fracture of stents, any collapse of endograft or others. The major problem is that the fixation of the graft is not secure compared to open surgery; thus, inadequate or improper fixation may cause problems in a short time after this treatment<sup>6</sup>. The efficacy of this treatment is also lower because of the prolonged scanning process after treatment.

Most patients had to face problems because of repetitive scanning to ensure the proper working of the graft in its particular place. The other major problem is seen in the form of damage to the nervous system. One out of ten men from Europe had shown any injury to the nervous system present in the front of the aorta as a result of Endovascular Aneurysm Repair treatment. The other problem related to Endovascular Aneurysm Repair is the formation of deep vein thrombosis after treatment, which can cause prolongation of treatment and increase the time of stay at hospitals.

Although the efficacy of this treatment is near 98 per cent, it has also been seen that the chances of endoleaks are increasing day by day after this treatment. If such a condition prevails, open surgery will also be needed to cure this problem<sup>7</sup>. The other problem is the high chance of renal deterioration because of this treatment. The dose of iodinated dye can cause contrast-induced nephropathy as well.

All of these complications are included in deployment complications. The other complications are classified as graft-related complications, which may include endoleaks of type one and type 2 because of different reasons such as unfavourable necks, improper replacement of graft, broken graft material, and others. All of these complications can make Endovascular Aneurysm Repair even worse because of post-treatment complications. If the graft is broken or improperly placed in a vessel, a prolonged procedure of repetitive surgeries will be needed to cure those complications<sup>8</sup>. The other problem is the high cost of endovascular aneurysm repair, which makes it less beneficial than traditional surgical methods.

The other problem is that it needs a high level of care and heed after treatment to maintain health, such as proper exercise, less intake of salts, a healthy lifestyle, a proper diet, and continuous suggestions from medical experts to maintain this treatment for a long time<sup>9</sup>. If all of these problems are considered properly, Endovascular Aneurysm Repair can be proved effective shortly<sup>10</sup>.

## RESEARCH OBJECTIVE

The main objective of this study is to understand the efficacy of Endovascular Aneurysm Repair in the long term. This study has effectively explained the problems related to post-treatment complications of Endovascular Aneurysm Repair, making it less beneficial.

The research determines that Evaluating the Long-term Efficacy of Endovascular Aneurysm Repair: A Ten-Year Follow-Up Study. This paper is divided into five specific chapters. The first section presents an introduction to the long-term efficacy of endovascular aneurysms. This section also presents the research objective. The second portion represents the literature review; the third section describes methodology and research methods. The fourth section represents that result and its descriptions of

variables, including descriptive statistics and correlation. This portion also presents a model of the algorithm between them. The last section summarises overall research and presents some recommendations for Evaluating the Long-term Efficacy of Endovascular Aneurysm Repair.

## LITERATURE REVIEW:

Researchers claim that the mortality rate due to aneurysm disorder is high. The patients who recovered from the endovascular aneurysm disorder are still at risk of redeveloping the disorder condition. The researchers use electronic media to compare the data related to the impact of long-term outcomes of aneurysm repair.

The data obtained through electronic media suggest that patients getting open repair treatment against aneurysms do not require reintervention<sup>9</sup>. Studies suggest that patients with aneurysms require reintervention even after fully recovering from the disease condition. By using new technology devices in the treatment process, the chances of reintervention for aneurysm-received patients are reduced<sup>7</sup>. Also, a preferable treatment procedure against endovascular disease is endovascular repair. The publications of several medical sectors regarding the response of aneurysm patients when provided with endovascular repair therapy. The publications suggest that patients show a positive response to endovascular repair therapy as this therapy requires the reoccurrence chances of abdominal aneurysm<sup>6</sup>. Scholars show that the electric therapy technique preferable for AAA treatment is EVAR.

The survival rates of patients undergoing the EVAR therapy increase. The available data on EVAR effectiveness predicts that the patients undergoing EVAR get a ten-year survival window<sup>4</sup>. Scholars explain that EVAS is a modern therapy-based treatment procedure. This modern repair therapy is used as an alternative to traditional repair therapy. The sealing of aortic veins with the help of EVAS is more effective than EVAR-based standard therapy. But despite of tremendous advantages of EVAS, this therapy is not used widely because of the error in some of its working parameters.

The failure of EVAS therapy to provide long-term efficient recovery in aneurysm patients makes this therapy unsuccessful in treating endovascular diseases<sup>11</sup>. Scholars predict that EVAR is used for treating the complications associated with AAA. Using new technology-based stent grafts in the treatment therapy provides an effective treatment response. Stent grafts are a modern therapy for aneurysm disease that provides secondary intervention. The five-year data obtained by the ENGAGE registry predicts that the survival rate of aneurysm patients increases when therapy is provided using modern stent grafts<sup>12</sup>.

Also, the effectiveness of EVAR is greater than the open repair because patients receiving EVAR show more positive treatment response<sup>13</sup>. Researchers highlight that EVR is another therapy used in the United States for treating endovascular disorders. The EVR treatment therapy is followed by re-intervention to improve the treatment therapy procedure.

Patients having highly severe diseases are more likely to get re-intervention right after the therapy-based treatment<sup>14</sup>. Studies claim that open and endovascular repair therapies provide their benefit during the treatment process, but both these therapies have proven effective for short-term recovery. The patients of AA require re-intervention after the OSR as well as EVAR therapies<sup>15</sup>. Studies elaborate that men having AAA undergo screening using ultrasound. Ultrasonic-based screening of AAA patients was reported by the preventive health care sector. The report suggested that short- and long-term treatment effectiveness is achieved through

ultrasound for AAA screening in men<sup>16</sup>. Studies predict that the EL condition occurs in endovascular disease-affected patients. This EL condition is treated by re-intervention in most patients. A patient with an Aneurysm who faces type 1 EL problems is at higher risk of mortality. providing the aneurysm patients facing EL condition with EVAR provides effective outcomes. the surveillance provided to aneurysm patients after EVAR therapy provides long-term benefits. Moreover, a year's duration is required to provide the aneurysm patients facing EL problems with reintervention<sup>17</sup>. Studies explain that the high mortality rate is associated with thoracic and abdominal aortic aneurysms.

Patients with aneurysms who are at Higher risk of mortality are provided with hybrid repair therapy. This hybrid therapy is also effective for aged patients<sup>18</sup>. Scholars' studies reveal that open repair therapy and EVAR therapy show individual benefits in the treatment process. The reports of most treatments against the aneurysm show that endovascular repair therapy is more effective during the preoperative stages<sup>19</sup>. Studies highlight that various electronic devices are used to assess the response of AAA patients when provided with EVAR.

The response of AA patients to EVAR therapy depends on certain factors, including patient disease severity and age. Studies predict that when an unselected population of AAA patients is given EVAR, then this group of the population shows improved treatment response, and the recovery chances are higher in this unselected population<sup>20</sup>. The requirement for long-term follow-up is explained, along with its justification: continued efficacy is required. The foundation for comprehending the long-term effects of EVAR is laid by concentrating on aneurysm sac stability and monitoring for late problems.

The study's goals are centred on a sound approach that includes a retrospective examination of patient outcomes spanning ten years. Strict patient selection standards guarantee a representative sample, and improved imaging methods improve data-gathering accuracy. scholars explain that IAO is a disease of lower limb that is often life threatening. the first treatment procedure used against the IAO is open surgery. The development of new technological tools have replaced open surgery with EVT therapy<sup>21</sup>.

EVT is a modern therapy used as an alternative to surgery-based treatments. the safety and high-efficiency features associated with EVT make it more suitable than bypass surgery. The preoperative complication can be reduced with the help of EVT.

Because of the great benefits of EVT, this therapy is used for treating most of the IAO patients<sup>22</sup>. Studies suggest that EVAR reduces the chances of preoperative mortality in AAA patients. the EVAR and OSR therapies have their own effectiveness during the early, mid and long term treatments process. studies explain that IMA is implemented during the aortic based reconstruction process. The efficiency of IMAR is applicable only to selective patients. moreover, the IMA re-implantation results in excellent treatment response.

The risk of colonic ischemia is reduced because of reimplantation<sup>23</sup> Studies reveal that TEVAR therapy efficacy improves by re-intervention. the survival rate of patient after getting TEVAR increases. The TEVAR therapy is provided to patients after understanding them deses complexity. also, the patients receiving the TEVAR therapy as well as TBD require more re-innervation therapies<sup>24</sup>. scholars explain that the patients of aneurysms shows different treatment responses when treatment is specifically provided for treating a

thoracic, abdominal aneurysm.

The management of tremnet procedure is most critical step while carrying out the treatment against the aneurysm. endovascular repair therapies are among the therapies used to repair aortic disorders in a highly controlled medical environment. furthermore, during the treatment process shelf devices are employed to enhance the efficiency of treatment procedure. Performing the EVAR therapy by a well-trained physician improves the quality of the therapy program and increases the chances of patient recovery<sup>25</sup>.

## METHODOLOGY:

### The Ten-Year Follow-Up Study's Goals:

Research Design and Techniques: The goal of the ten-year follow-up research is to methodically evaluate EVAR's long-term effectiveness in a group of AAA patients.

There are be a retrospective review of patient outcomes, including events connected to aneurysms, death rates, and the requirement for repeat treatments. To assess aneurysm sac features and stent-graft integrity, advanced imaging modalities, including computed tomography angiography (CTA), will be used.

### Patient Selection and Inclusion Criteria:

The research population will consist of a well-defined cohort of individuals who had EVAR ten years before. The rigorous inclusion criteria will consider variables including the size of the aneurysm, the anatomical appropriateness for endovascular treatment, and the observance of follow-up procedures. The selection procedure aims to provide a representative sample that accurately depicts EVAR's actual results.

## IMPORTANCE OF THE RESEARCH:

### Clinical Implications:

The results of this 10-year follow-up research will have a significant impact on clinical practice. A thorough grasp of the long-term robustness and effectiveness of EVAR will direct surveillance procedures, influence treatment choices, and further advance the development of endovascular procedures.

### Advancing Scientific information:

The study advances our understanding of vascular treatments by adding to the body of information outside its clinical uses. Understanding the development of endoleaks, the natural history of EVAR-treated aneurysms, and the factors that indicate late problems will add to the body of knowledge already in existence and promote ongoing improvement of vascular treatment approaches.

### Verdict:

The field of AAA care has changed dramatically with the advent of endovascular aneurysm repair, which provides a less intrusive option to open surgery. "Evaluating the Long-term Efficacy of Endovascular Aneurysm Repair: A Ten-Year Follow-Up Study" is a significant effort to thoroughly assess EVAR's long-term efficacy and durability.

Through tackling the difficulties and unknowns surrounding long-term results, this research seeks to provide important information that will influence AAA treatment approaches going forward and improve patient care.

**DESCRIPTIVE STATISTIC:**

Table 1

Name	No.	Mean	Median	Scale min	Scale max	Standard deviation	Excess kurtosis	Skewness	Cramér-von Mises p value
LTE1	0	1.510	1.000	1.000	3.000	0.610	-0.305	0.794	0.000
LTE2	1	1.490	1.000	1.000	3.000	0.643	-0.070	0.991	0.000
LTE3	2	1.469	1.000	1.000	3.000	0.575	-0.329	0.788	0.000
LTE4	3	1.510	1.000	1.000	3.000	0.576	-0.554	0.621	0.000
LTE5	4	1.429	1.000	1.000	3.000	0.571	-0.006	0.967	0.000
LTE6	5	1.469	1.000	1.000	3.000	0.610	-0.042	0.958	0.000
LTE7	6	1.571	2.000	1.000	3.000	0.606	-0.545	0.567	0.000
EAR1	7	1.429	1.000	1.000	3.000	0.571	-0.006	0.967	0.000
EAR2	8	1.449	1.000	1.000	3.000	0.574	-0.181	0.876	0.000
EAR3	9	1.551	1.000	1.000	3.000	0.608	-0.484	0.641	0.000
EAR4	10	1.510	1.000	1.000	3.000	0.610	-0.305	0.794	0.000
EAR5	11	1.306	1.000	1.000	3.000	0.503	0.885	1.355	0.000
EAR6	12	1.429	1.000	1.000	3.000	0.571	-0.006	0.967	0.000

The above result shows that descriptive statistical analysis results describe the mean values, median rates, maximum values, and minimum values and present the skewness rates of each variable. The above result presents that probability values of each indicator included dependent and independent. The LTE1 is the main independent variable. it represents that the mean value is 1.510, and the standard deviation rate is 61%, deviating from the mean.

The skewness rate is 79%, and the excess kurtosis rate is -0.305, showing the negative value of an independent variable. according to the result, the overall minimum value is 1.000, the maximum value is 3.000, and the median rate is 1.000 for each variable. according to the result, the overall probability value is 0.000, which shows a 100% significant level between

them. the LTE2, LTE3, LTE4, LTE5 and LTE6 are all considered independent variables related to the main factor shows that mean values are 1.490, 1.469, 1.510, 1.429 and 1.469.

These all shows positive average values of the mean. The standard deviation rates are 64%, 57%, 61%, and 60% deviate from the mean. The probability value of LTE is 0.000, which shows a 100% significant difference between them. the EAR1, EAR2, EAR3,4,5 and 6 are all consider as dependent variables. According to the result its mean values are 1.429, 1.449, 1.551, 1.510, 1.306 and 1.429 these are shows that positive average value of mean. The standard deviation rates are 57%, 60%, 61%, and 57% deviate from the mean.

**CORRELATION COEFFICIENT:**

Table 1

	LTE1	LTE2	LTE3	LTE4	LTE5	LTE6	LTE7	EAR1	EAR2	EAR3
EAR1	0.134	0.040	-0.240	-0.168	0.062	0.126	0.059	1.000	0.000	0.000
EAR2	-0.363	0.123	0.165	0.048	-0.338	-0.077	-0.034	-0.276	1.000	0.000
EAR3	-0.263	0.040	0.194	0.071	-0.327	-0.202	0.087	-0.386	0.285	1.000
EAR4	0.233	0.508	-0.334	0.305	0.017	0.069	0.702	0.017	0.045	0.067
EAR5	-0.176	0.104	-0.214	0.024	-0.385	0.064	0.096	0.041	0.089	0.116
EAR6	-0.159	0.318	0.071	0.018	-0.062	0.008	0.295	-0.125	0.347	0.084
LTE1	1.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
LTE2	0.091	1.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
LTE3	0.074	-0.180	1.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
LTE4	0.014	0.152	-0.230	1.000	0.000	0.000	0.000	0.000	0.000	0.000
LTE5	0.602	-0.016	0.319	-0.106	1.000	0.000	0.000	0.000	0.000	0.000

The above result represents that correlation coefficient analysis results describe that EAR1,2,3,4,5 and 6 these are showing some negative and some positive interrelation between them rates are -0.159, 0.071, -0.062, -0.214, respectively. The LTE1, 2,3, 4,5, 6, 7 shows that 0.074, 0.014, 0.015, and 0.095 show positive and significant interrelation.

**Applications:**

The rupturing of organs in TBAD condition requires urgent surgery of the organ. The mortality rate due to TBAD is higher in most counties. The rupturing of the aorta, as well as hypertension followed by pain sensation, increases the severity of TBAD. to treat the patient facing TBAD problem, effective therapies are used in the treatment process. For repairing thoracic aneurysms, artificial transplantation therapy is used in the clinical process. Among all the treatment options for TBAD, OSR therapy holds significance. OSR Is the most preferable treatment approach for TBAD. Despite the improvement in the operative and surgery techniques, the high mortality is caused due to surgery-based treatment of TBAD. In the year 1991the

technique of endovascular stent implantation was used for treating abdominal aortic disorders. The same technique was employed to treat TBAD in the year 1999. using various modern treatment therapies to treat TBAD is essential to reduce the deaths caused by TBAD.

Another therapy used for aneurysm repair is TEVAR. For treating the defect of the upper aorta the use of TEVAR is made. This therapy has gained popularity all over the world because of its treatment efficacy Several features make TEVAR a special therapy. The first feature of TEVAR is that it lowers the time of surgical operation. The second feature is that less blood transfusion is required to carry out the TEVAR process. The third characteristic of TEVAR is that it is a noninvasive therapy technique. despite the great features and benefits of TEVAR, this therapy procedure still has some drawbacks. Endo-leaks are the main complication faced during TEVAR therapy. Problems during graft transplantation may also occur while providing TEVAR to the patient. Moreover, the long-term survival chances of patients treated with TEVAR are lower. Certain risks are associated with the

use of TEVAR therapy. These risks are the possibility of a loss of the leg of the patient, temporary paralysis condition, as well as bleeding. These risks associated with TEVAR therapy reduce its efficiency and make it less suitable for most aneurysm patients.

Since the first use of EVAR in 1991, it has been a widely used therapy. The chances of abdominal repair increase by seventy-four to seventy-six percent using EVAR. The randomized data obtained with the help of DEREAM predicts that the mortality rate associated with AAA reduces when treated with EVAR therapy. A critical type of EVAR is FEVAR. Defects in the parts of the aorta that are involved in transferring blood to various parts of the kidney are treated using FEVAR. This therapy procedure allows the surgeon to treat an aneurysm while keeping the flow of blood steady. The patients treated with EVAR can return home the next day after the surgery. The patients undergoing the EVAR surgery can perform their normal activities after months of recovery. Most people recover within three weeks after the EVAR-based therapy treatment. The one great benefit of EVAR is that the patients undergoing EVAR have little chance to go for an open surgery-based treatment process. The need for open surgery is reduced by treating the patient with EVAR. In several aneurysms, the repair of the aorta is done using OSR therapy as compared to EVAR. As it is an open surgery, the recovery period for the patient is longer. After surgery, the patient must stay in the hospital for at least a week. Even after going home, the patient is advised to rest for six to 12 weeks. As open surgery repair for aneurysm treatment is a major operative surgery, certain complications can occur during the surgery process. These complications or risks are dangerous for the patient and can be life-threatening. heart attack, as well as atrial infection, are the risks associated with open surgery. The incidence of complications during the operation is very rare. There is only a seven percent risk of complications during the OSR. Only a person having serious medical problems in the past faces severe complications during the OSR procedure.

The studies made to assess the efficiency of OSR and EVAR therapies suggest that both these therapies have their efficiency in treating aortic disorders. The patients treated with the EVAR require re-intervention after

some time. At the same time, patients treated with OSR do not require any re-intervention. The complications caused by EVAR therapy are Higher than graft complications caused by OSR. The cost of providing EVAR therapy to patients is more than OSR.

Using advanced EVAR-associated devices helps reduce the risks and complications of EVAR therapy-based treatment. The modernized and modified EVAR reduces patients' complications during the EVAR-based therapy process and simplifies the overall surgery process. To opt for OSR or EVAR therapy is not a patient choice. Patients who have certain physical disabilities undergo EVAR treatment therapy. The CT technique is used in the clinical procedure to assess an aneurysm patient's health status and recovery status. The CT provides details about the patient's health condition. EVAR therapy is followed by CTA trials to identify patient health after the therapy and to guide the patients for future imaging-based treatments. The patients showing no Endo-leak are monitored using the ultrasonic technology after the EVAR therapy. While patients showing type 1 and type 2 Endo-leak require re-intervention after therapy. After the EVAR therapy, a CT scan is done to check whether the patient still has AAA symptoms. The information regarding the aneurysm size is predicted using the CT scan. CT scan is regarded as an excellent scanning technique for AAA patients.

Using the conventional radiography technique provides insight into the positioning of grafts in AAA patients during the therapy-based treatment process. AP radiography technique is beneficial in detecting the migration of endografts. The use of AP radiography has evolved from the use of conventional radiography techniques. AP radiography is preferable to conventional radiography for determining the aneurysm residual and size. Moreover, surgeons use the AP radiography scanning technique to evaluate the Endo leaks and graft infections. Another scanning technique used as an alternative to CTA is MRA. This imaging technique is useful for detecting the nitinol endograft. When MRA is used with a combination of TOF techniques, the overall efficiency of this imaging technique improves. The endo-leak detection limit improves by up to seventy-nine percent by combining MRA with TOF.

**SMART PLS ALGORITHM MODEL:**

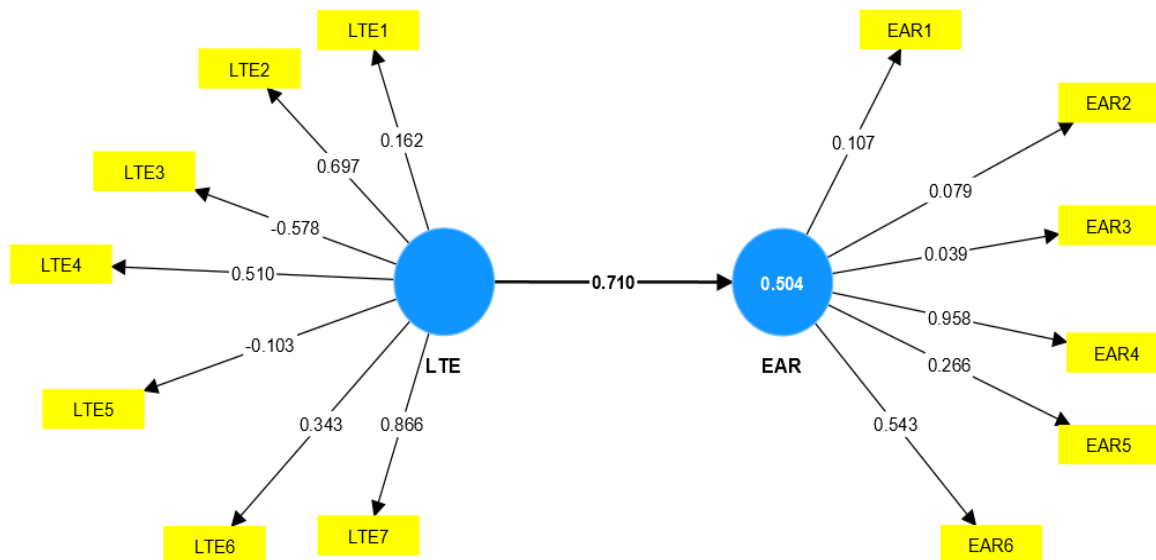


Figure 1

The above model represents the smart PLS Algorithm model between LTE and EAR. According to the model, LTE shows that 0.162, 0.698, -0.578, 0.510, and -0.103 show negative and some positive rates. The result shows that 16%, 69%, 57%, 51%, 34% and 86% significantly level between them. Similarly, the EAR considered a dependent variable model presents that 0.107, 0.079, 0.039, 0.958, 0.266, and 0.543 show that all factors represent a positive relation between them. The result describes 10%, 7%, 3%, 95%, 26% and 54% significantly relation. According to the algorithm model result, there is a 71% positive and significant relation between LTE and EAR.

## CONCLUSION:

The study "Evaluating the Long-term Efficacy of Endovascular Aneurysm Repair: A Ten-Year Follow-Up" provides a thorough assessment of the long-term efficacy of endovascular aneurysm repair (EVAR) and marks a significant advancement in the ongoing development of abdominal aortic aneurysm (AAA) management. Based on a historical framework that emphasizes the transition from open surgical procedures to the less invasive EVAR, the study shows the importance of developments in vascular therapies. As demonstrated, the development of EVAR technology has significantly enhanced the short-term results, rendering it a desirable substitute for qualified patients. Recognizing issues like Endo leaks and device migration requires a sophisticated comprehension of EVAR's long-term robustness and efficacy. As previously mentioned, there are several

reasons for a longer follow-up time. These include the need to evaluate the integrity of the aneurysm sac, spot late problems, and improve surveillance techniques. The goals of the well-planned study, which has a strong methodology, centre on a retrospective investigation of patient outcomes spanning ten years. The study's accuracy and dependability are enhanced by using sophisticated imaging modalities and incorporating strict patient selection criteria. The results should light the incidence of late complications, the natural history of aneurysms treated with EVAR, and the need for follow-up procedures. This finding especially has ramifications that go beyond the immediate clinical setting.

The research can influence treatment choices, direct surveillance procedures, and advance our understanding of vascular treatments in general. Through this study, we hope to contribute to the ongoing improvement of treatment approaches in vascular medicine. A significant addition to the area of vascular surgery, "Evaluating the Long-term Efficacy of Endovascular Aneurysm Repair: A Ten-Year Follow-Up" concludes. It is anticipated that the knowledge gathered from this research will influence future approaches to treating AAA, enhance patient outcomes, and promote continuous progress in the ever-evolving field of endovascular therapies. The scientific and medical community's commitment to assessing the long-term effects of EVAR is significant, as it represents a substantial advancement in improving the standard of treatment for patients suffering from abdominal aortic aneurysms.

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